Address in Medicine

ON

THE CIRCULATION VIEWED FROM THE PERIPHERY.

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MR. PRESIDENT, LADIES, AND GENTLEMEN,—In the first place I must thank you, and through you the whole British Medical Association, for the high honour which has been conferred on me in my appointment to deliver this address. This is an honour and a privilege which happens to very few men, and that only once in a lifetime. I feel the dignity of the office and the obligations which it entails all the more deeply inasmuch as the invitation in the first place came from the members of the Association resident in this city. When the invitation was conveyed to me I rather hesitated to undertake a task which I felt I could only inadequately perform, but, on the other hand, I looked upon the request as a command, and it seemed to me that I could scarcely refuse to undertake a duty for which I had been selected by my Canadian brethren.

After accepting the task my difficulties began, and my first was in choosing a subject which would have a more or less general interest. I intuitively turned my attention to the circulation, the ramifications of which pervade the whole field, and as writers hitherto on this subject have almost invariably traced the circulation from the centre to the periphery it occurred to me that we might get a fresh view if we turned our attention in the opposite direction. There are numerous treatises on diseases of the heart and aorta, but until recent years a careful study of the peripheral circulation has been largely left to physiologists and pathologists. The experimental work of Cohnheim will ever remain a landmark in the pathology of the circulation, while to the school of Ludwig physiologists are no less indebted. To physiology medicine owes much and all great advances are being prosecuted along physiological lines. I have previously asserted that diseases of the heart most frequently arise from causes acting on the periphery, and hence there is here no room for specialism. The man who only studies the circulation with the aid of a stethoscope is a positive danger to society. I can, therefore, with an easy conscience and a sense of much satisfaction, devote some attention to that periphery.

The capillaries through which the interchange of nutritive pabulum and gases takes place between the blood and tissues play a most important rôle in the animal economy. Yet they have received very inadequate attention from clinicians. Perhaps it has been thought that their structure and position could be so briefly described that any circumlocution in their description was unnecessary. But however simple their structure, and however apparent their functions, they constitute a vast filter-bed for conveying nutritive material and oxygen to the tissues and for removing waste products therefrom. A careful study of how these changes take place and how the functions of these little tubes are carried on has always seemed to me a matter of as much importance as even the action of the heart itself. These little vessels are of extreme tenuity and delicacy, consisting of a single layer of endothelium, yet they are much stronger than most people imagine, and are capable of standing considerable internal pressure; they vary from about 0·5 to 1 millimetre in length, and from 7 to 13 micro-millimetres in diameter. They are to a certain extent elastic, or at least they have the capacity of adapting themselves to the amount of blood which is driven through them. Their importance has been aptly described by Leonard Hill, who says: "The blood is brought into intimate relation with the tissues by diffusing through the endothelial wall of the capillaries, and this wall is of great tenuity; thereby takes place that change of material which maintains the combustion of the body and the fire of life."

The capillary bed is a vast territory which pervades every tissue and organ of the body and so numerous are these little vessels that it would be difficult to stick the point of a needle in any vascular area without wounding one or more, but in neurotic individuals you may wound many such vessels without drawing blood. In very plethoric individuals and in cases of polycythæmia the capillaries of the body are fairly replete, but in ordinary mortals, especially in those of neurotic temperament, perhaps not a third of the capillaries are full at any one moment. Apply a sinapism to a very pallid skin and you may wonder where all the turgid capillaries have sprung from. From the fact that in normal circumstances a sufficient quantity of blood cannot get through the arterioles to keep the enormous capillary bed full the lateral pressure and the velocity in the capillaries are ever-varying quantities. When Leonard Hill stated that the pressure in the capillaries under certain conditions is often over 100 millimetres of mercury, I thought that there must be some error of observation as I was under the impression that such pressure would rupture these delicate little vessels, but I remembered the old advice: Do not think; try. I tried and found that Leonard Hill had rather understated the fact, as I found variations from about 50 to 2000 millimetres of water. I also found equally great variations in the velocity of the blood in the capillaries. In text-books on physiology it is put down from 0·2 to 0·75 millimetre per second but my observations have given records from about 0·5 millimetre to 25 millimetres per second. The capillary bed covers an enormous area; take, for example, the lungs where all the air vesicles are surrounded by a meshwork of capillaries and the surface of the air vesicles in the average individual has been calculated by Zuntz at 90 square metres. Numerous attempts have been made to estimate the capacity and sectional area of the capillaries but in my opinion these questions are still unsolved.

In a paper on tubal nephritis published in 1883 and in one on the pathology and treatment of dropsy in 1886 I dealt with the capillary circulation. I have long been in the habit of estimating the velocity by compressing the blood out of the capillaries in a given area and then watching the quickness or velocity of the return. This has served, and still serves, my purpose, but when I wish to record my observations I use a glass rod ten millimetres in diameter. With the flat end of this rod I compress the capillaries and then with a stop-watch recording fifths of a second I time the period of the return of the blood. If you divide the radius of this rod (five millimetres) by the time you get the velocity per second. For these observations you must select some spot where there is a network of capillaries which you can completely empty, such as those in the back of the hand or finger and you must also choose a spot where the return current flows from all parts of the circumference. This method is so simple and accurate that it is a matter of surprise to me that, so far as I know, it has never been thought of before.[1] When fluid is circulating in a capillary tube, the axial velocity is double the mean velocity. Now the erythrocytes travel in the axis but as they occupy at least four-fifths of the lumen of the vessel the mean must be fully 0·8 of the observed velocity. For estimating the pressure in the capillaries I use a modification of von Kries's apparatus. For applying the pressure I use three sizes of glass plates, measuring 20, 100, and 400 square millimetres, so a gramme pressure on each of these plates represents respectively 50, 10, and 2·5 millimetres of water. As before stated, I have recorded capillary pressures varying from 50 to 2000 millimetres of water and my velocity records have

[1] Dr. George Oliver has drawn my attention to a capillary dynamometer devised by Dr. Alexander Haig for gauging the amount of uric acid in the circulation and estimating the blood pressure. Dr. Haig compresses the blood out of the capillaries under pressures varying from about five to 20 ounces and times the period of compression and of the capillary reflex. Dr. Haig says that his "instrument gives a constant definite area of pressure—a definite and measurable force, the pressure being applied for a definite and constant time, measured by a metronome beating half seconds, the length of time the blood and colour take to return being measured by the same instrument." Our methods are similar but our objects are different. At one time I thought of drawing up rules for estimating the arterial blood pressure by the capillary velocity but I soon found that the necessary corrections on account of the contraction or dilatation of the arterioles, the position and temperature of the part under examination, and perhaps the viscosity of the blood were so numerous as materially to lessen the clinical value of any such method.

ranged from 0·5 millimetre to over 25 millimetres per second.

[Sir James Barr here considered at some length the lateral pressure and velocity of the blood in the capillaries and the effects of gravity on the capillary pressure. He continued as follows:—]

I have shown that the capillary pressure in the foot, even when immobilised, is often less than that in the hand and much less than that in a grog-blossomed nose. This is entirely due to the wonderful mechanism of the vaso-motor system. Some people are very liable to cold feet in bed and such appendages to a lady seem to have led up to a divorce in the United States of America. In such cases the part may be fairly comfortable before going to bed, but once the horizontal posture is assumed the arterial pressure and capillary velocity fall, so that there is not a sufficient amount of fuel carried to the extremities to keep the large cooling surface warm. Here the defect is in the initial energy, and besides improving the general arterial pressure it would be advantageous to keep the feet much lower than the head and shoulders.

When the arterioles are dilated in any area, as at the commencement of an inflammation, the whole of the capillaries are opened up and engorged with blood, and with this increased mass the pressure is raised, but the velocity is also heightened owing to the arterial potential remaining high and the resistance in the enlarged capillaries being diminished. The resistance is inversely as the square of the cross sections, or the fourth power of the diameter, or directly as the square of the velocity. We have seen how hydrostatics affect the pressure in the capillaries, but the velocity is much more uniformly affected. It is usually sufficient to lower the hand 320 millimetres in order to double the velocity, and in the capillaries of the foot the velocity is usually extremely rapid. Velocity, $V = \sqrt{2gh}$; but in the capillaries we have further to take into account the sectional area, which has not yet been accurately computed either in whole or part.

So readily is the capillary velocity affected by the arterial pressure that, *ceteris paribus*, you can easily detect a difference between the velocity in the back of the hand and in the fingers: when a warm hand is hanging down the velocity in the finger is greater than in the back of the hand and if the relative position of these parts be altered the velocities are reversed. I purposely said a warm hand, because in a cold hand the capillary circulation in the fingers is often very languid. After removal of an Esmarch's tourniquet the capillary velocity in the flushed extremity is considerably augmented.

Any obstruction to the outflow from the capillaries diminishes the velocity in them. The hydrostatic effect of the blood in the veins would materially obstruct the capillary flow only for the provision of valves, and the muscular compression hastens on the blood and thus diminishes the statical condition. However, certain capillaries, such as those of the liver and kidneys, are exposed to considerable backward pressure when from any cause the venous pressure is raised. When the velocity in the capillaries is reduced to one millimetre or less per second the blood becomes surcharged with carbonic acid and the skin or organ supplied becomes of a dusky hue. This appearance immediately disappears if you increase the capillary velocity; for example, when the hand is blue and passively congested from cold, or the so-called local asphyxia, if you let it hang down you increase the velocity and you quickly see bright red spots intermingled with surrounding lividity, and soon the colour of the whole hand improves. In the cold livid dependent hand the colour of the fingers is better than that of the back of the hand. When you get cardiac failure with or without any obstructive lung disease, you frequently see the upper part of the body and the hands quite dusky, while the legs and feet, which are at a lower level, may be pale. In one marked case of cardiac failure where the upper part of the body was livid I saw one foot and part of the leg in a state of local syncope and as pale as marble. These patients do not require a cylinder of oxygen with which they are frequently plied but the judicious application of a little common sense, such as the intravenous injection of small doses of adrenalin or some cardiac tonic. In cases of Raynaud's disease the local syncope is ascribed to vaso-motor spasm, but really the spasm, if it exists, is a very mild affair. In these cases the arterioles shut down because there is not sufficient blood pressure to keep them open. The arterial pressure is always low and the blood is deficient in lime salts and viscosity. In the cases of local asphyxia the arterioles are not closed, but the arterial potential is low, the velocity in the capillaries is defective, and the *vis viva* is not sufficient to drive on the blood stagnating in the veins. In cases of erythromelalgia the reverse happens; the velocity and pressure are both increased in the large engorged capillaries.

In many cases of pneumonia with low blood pressure the vaso-motor taps in the splanchnic area are all open and the aorta is drained before it terminates in the iliac arteries; the bulk of the blood is retained in the chest and abdomen and the quantity supplied to the lower limbs is diminished. Moreover, the extremities are often colder than the body and the arteries contracted. The lower level of the limbs increases the velocity in the capillaries and veins and consequently the capillaries of the foot and leg are often blanched and the veins comparatively empty when the upper part of the body appears congested and purple.

VISCOSITY OF THE BLOOD.

The viscosity varies greatly and is no doubt the great cause of resistance in the capillaries. Normally it is about five times that of distilled water, and my friend Dr. John H. Watson, who has recently been doing some valuable work on this subject in association with a physicist, Dr. A. Du Pré Denning, has found that in many diseases the viscosity is nine or ten times that of distilled water. The coefficient of viscosity in the tarry blood of Asiatic cholera is often so great that it will not pass through the capillaries. Dr. J. J. Graham Brown and others have found that a rise in temperature lessens the viscosity and hence a febrile temperature lessens the resistance and so diminishes the work of the heart, but it does not follow from this that a high temperature in fever is an advantage, as there are many more efficient ways of lessening the viscosity. Dr. Watson and Dr. Denning have devised a very convenient capillary viscosimeter which shows these variations in this physical property of the blood. They conclude that the chief resistance to the flow is due to the viscosity and occurs in the capillaries. It has long been a disputed point as to whether the resistance to the arterial flow, and consequently to the heart, is situated in the capillaries or arterioles.

Sir William H. Broadbent, I believe, even now throws the weight of his deservedly great name in favour of the resistance being in the capillaries; and in cases of vaso-motor paralysis no doubt such is the case, but in ordinary circumstances I agree with the majority that there is an earlier barrier to the outflow from the heart in the arterioles and small arteries which are governed by vaso-motor nerves. This can be readily proved by the fact that there is very little fall in the pressure-gradient from the large to the small arteries. The pressure in the radial and tibial at the same levels is as great as that in the brachial and femoral. When you come to the very small arteries and arterioles which are offering resistance to the flow there are a very great fall in the pressure and an increased velocity. The fall between the radial and digital artery may be as much as 50 millimetres of mercury, and there may be an even greater fall in the pressure-gradient between this and the capillaries. Now, if the capillaries formed the first line of resistance the fall in the pressure-gradient would be much more gradual and high arterial pressure would be associated with high capillary pressure, but we know the reverse to be the case.

It is extremely fortunate that there is this first line of defence created by the action of the vaso motor nerves in the small arteries and arterioles, because if this were wanting as at present constituted we should either have to go about on all fours or constantly run the risk of fatal syncope.

[Sir James Barr here quoted the opinions of several physiologists on various questions connected the viscosity of the blood. He continued as follows:—]

THE INTERCHANGE OF MATERIAL THROUGH THE CAPILLARY WALLS.

There are some physiologists who would raise the endothelial cells of the capillary walls to the high level of secreting structures; not that they have any evidence, either from analogy or otherwise, in support of such a contention, but simply because they think that the physical properties of diffusion, osmosis, and filtration cannot account for the phenomena. They hold that the capillary pressure is low and is more than counterbalanced by the endosmotic equivalent of the albumin and salts in the blood. When

they recognise the enormous variation which takes place in the pressure and velocity of the blood in the capillaries they will have less difficulty in admitting the problem of filtration as applicable to the capillary circulation. The fall in the pressure-gradient in the capillaries must be fairly uniform from arteriole to venule, but as there is usually a considerable fall from the capillaries to the veins there must be a corresponding difference between the efferent and afferent capillaries and thus transudation and absorption in different parts of the same network can be readily explained. In the intestinal capillaries the larger and deeper vessels supply the secretory structures and the smaller and more superficial vessels are the absorbents.

The interchange of gases which are in solution readily takes place by the process of diffusion; and osmosis must play a very important part in transudation and absorption according as the osmotic equivalent is greater on one side or the other of the capillary membrane. In 1886, when dealing with the pathology of dropsy, I said: "Fluids pass very readily through organic membranes, such as the walls of the capillaries, by a process of osmosis, but albumins do not thus readily transude. Unlike the capillaries of the lungs and kidneys the systemic capillaries allow albumin to pass through their walls, so that it is found in all the intercellular fluids. Now, if it does not pass through by osmosis, we must suppose it to be filtered through under varying amounts of pressure. In filtering under pressure, as a rule, the greater the pressure the greater the amount of the filtrate, but the composition of the latter differs very materially from the nature of the compound fluid submitted to the pressure, as the different constituents pass through with varying degrees of ease, the water passing through much more readily than the albumin. Hence, although the total amount of albumin passed through may be increased according to the quantity of the filtrate, its percentage is diminished. Hence the greater and more rapid the production of dropsy—if there be no increase in absorption—the less the relative amount of albumin." Runeberg in 1882 expressed similar views when he maintained that the concentration of a colloid filtrate is greater at lower than at higher pressures.

THE ARTERIOLES AND CAPILLARIES OF THE SKIN.

The arterioles are well endowed with muscular fibre and vaso-motor nerves, chiefly of the constrictor type; frequently they are so contracted that the capillaries are almost empty, and in cases of local syncope quite empty, and the pressure and velocity fall to zero. When the vaso-motor nerves are paralysed from a central cause the capillaries are full, their pressure increased, and the velocity diminished. When paralysed from a local cause—such as a mustard poultice—the capillaries are engorged and the pressure and velocity increased. Witness also the effects following the application and removal of an Esmarch's tourniquet. These little vessels are reciprocal to those of the splanchnic area, and are largely concerned in regulating the temperature of the body and in maintaining the general arterial pressure.

The capillaries form an exceedingly close network in the corium and send loops up into the papillæ. The pressure and velocity vary enormously. After a liberal meal—especially one containing ingredients which dilate the arterioles, raise the diastolic arterial pressure, and thus provide an abundant supply of blood to, with increased pressure in, the capillaries—there is a free outpouring of lymph. In my opinion, a good deal of the work which has been done on the so-called digestion leucocytosis has been rendered worthless by the work of George Oliver on the tissue lymph circulation. These observations were made on blood obtained from a prick of the finger and this consists of a mixture of blood and lymph. The white cells are increased—the increase being in the lymphocytes—in proportion to the dilution with lymph and the red cells are proportionately diminished. If the lymph be compressed out of the tissues and then a drop of pure capillary blood be obtained there will be found in it an increase of red cells, and the white cells will be much less than in the mixed blood and scarcely any more than would be obtained by an ordinary puncture two or three hours later when the lymph had been reabsorbed. This so-called digestion leucocytosis is therefore no evidence of any increase of white corpuscles in the circulating blood but merely that lymph has been pressed out from the vessels, and in this lymph there is a considerable number of leucocytes, probably obtained from the tissues rather than from the capillaries. There is, no doubt, a digestion leucocytosis but it is not what has been described.

[Sir James Barr here gave various details of the structure and physiology of the arterioles and capillaries of the splanchnic area and the kidneys, of the capillaries of the liver, and of the cerebral and coronary vessels. He continued as follows:]

THE PULMONARY CIRCULATION.

The pressure in the pulmonary artery is not more than one-third and the velocity of the blood about three-fourths of those respective conditions in the aorta; but, unlike the vena cava, the pressure in the pulmonic veins is always positive, so that the blood always enters the left side of the heart under pressure, while it is usually sucked into the right side. There is a gradual fall of the pressure-gradient from the right ventricle to the left auricle and there does not seem to be much resistance to the circulation either in the arterioles or capillaries. Bradford and Dean and François Franck have shown by a series of very elaborate experiments that the pulmonic vessels are innervated; but while such innervation may be sufficient to maintain slight tone in the vessels some experiments with adrenalin would show that it cannot constrict the vessels so as to effectively increase the resistance.

Respiration renders great assistance in carrying on the circulation to the right side of the heart and to a less extent to the left. That the assistance extends to the whole circulation is shown by the fall in the arterial pressure which occurs at the beginning of inspiration. In the so-called pulsus paradoxus (there is no paradox but merely an exaggeration of a perfectly normal phenomenon) and in Müller's experiment of expanding the chest with the glottis shut the pulse may disappear at the wrist. This is due to the sudden emptying of the veins to fill up the vacuum in the chest and with this removal of the obstruction to the capillary flow there is a simultaneous depletion of the arteries. It is not due, as has been supposed by Kussmaul, to any kinking of the large vessels, or to any sucking back of the blood into the aorta, as has been imagined by those who seem to have forgotten that the pressure in the aorta is always high and cannot be affected by a negative pressure in the thorax. It is due to a certain fall in pressure affecting the veins, capillaries, and arteries, and it is most marked in cases of low arterial pressure. When the arterioles are much contracted and the arterial tension high, as in cases of Bright's disease, it does not occur. The lungs form a blood reservoir for the left side of the heart and during this expansion the reservoir is increased and has to be filled up before the left side of the heart is sufficiently well supplied with blood to enable it to throw the proper quantities into the aorta at each systole; the arteries are therefore emptied at their distal end and not filled at their proximal end and so the pulse disappears until an equilibrium is restored.

I recently had a very good example of this in a case of bradycardia under my care where the frequency of the pulse varied from 12 to 24 beats in the minute. When Dr. John Hay and my house physician, Dr. Jones, were taking cardiographic and sphygmographic tracings I found that when the patient took a long deep breath and then held his chest expanded as long as possible the following events occurred. During the deep inspiration there were two beats of the heart and two pulses at the wrist, then the pulse disappeared in the carotid, brachial, radial, and femoral arteries, and remained absent for several beats. At the same time the impulse of the heart disappeared and the clear loud first sound and systolic murmur were replaced by a low, dull-toned, obscure sound, and the second sound was not audible. After four or five faint systoles, which I attributed to the right ventricle, the clear first sound and systolic murmur and the double second sound reappeared and were associated with a return of the pulse in all the arteries. Here undoubtedly the blood was stored up in the lung reservoir and the proper systoles of the left ventricle and the pulse in the arteries did not reappear until the reservoir overflowed. He had several attacks of semi-consciousness and one slight epileptic seizure during the periods of suspended breathing with the chest expanded. These attacks always occurred after the pulse had ceased for about 20 seconds.

In 1904 Dr George Oliver gave a great stimulus to the study of the peripheral circulation by the publication of his admirable work on the tissue-lymph circulation. He showed

that during the first hour of digestion there was a rise in the blood pressure—arterial, capillary, and venous—with a flow of lymph into the tissues; during this wave there might be a difference of from 10 to 20 per cent. in the number of erythrocytes and in the hæmoglobin between the mixture of blood and lymph obtained by a simple prick of the finger and that of the pure capillary blood obtained from the same prick after the lymph had been compressed out of the finger. He also showed that the same extracapillary lymph flow occurred in the muscles and prevented any further rise in the arterial pressure from tension exercises. His observations led him to the following conclusions: "1. That the food constituents themselves (proteids, fats, and carbohydrates) do not possess the power of starting the mechanism by which lymph is dispensed to the tissues through the body. 2. That Nature, however, associates with our foodstuffs small quantities of very active substances which bring into play that mechanism, though these substances themselves are practically devoid of food value, and that man frequently increases this natural lymph by the use of salt and beverages containing bodies which also incite the flow of lymph. Such bodies as uric acid, creatin, creatinin, xanthin, glycogen, and sodium chloride perform an important function in nutrition, for during digestion they act as distributors of lymph to all the tissues—an office which the nutrient constituents themselves (proteids, fats, and carbohydrates) are incapable of discharging." Dr. Oliver associated the action of these lymphagogues with a rise in capillary blood pressure, but in 1891 Heidenhain had ascribed the action of such agents to a specific excitation of the secretory activities of the endothelial cells. We have before referred to the careful experimental work of Starling in 1893, by which he refuted the conclusion of Heidenhain and re-established the doctrine of filtration under pressure.

When a person is standing the venous pressure in the foot is raised, but so also is the arterial. Supposing in the circumstances you have a venous pressure in the foot of 100 millimetres of mercury obstructing the capillary flow and an arterial pressure of 300 millimetres of mercury, you have a difference of 200 millimetres of mercury driving the blood through the capillaries with great velocity and very little lateral pressure. If, then, the subject assume the horizontal posture, and raise the foot till the venous pressure be *nil*, there will be a corresponding fall in the arteries of 100 millimetres of mercury, but there will still remain the same difference between the arteries and veins of 200 millimetres. The following physical experiment readily explains this question of pressure and velocity. If you construct a U-shaped tube out of india-rubber tubing, having both the limbs very wide, and a short connexion made of very fine tubing, then make a small hole in each of the three pieces and connect one of the limbs with a water-tap, you will then find that the water comes out in a forcible jet from the hole in the proximal limb or artery, with less force from the hole in the distal limb or vein, but from the hole in the capillary there is no escape; the energy in it is all converted into velocity. If you compress the vein, then you raise the lateral pressure in the capillary and thus cause an escape. In the healthy individual the arteries of the lower limbs are firmly contracted, and although the pressure is high the mass of blood on which it acts is relatively small and consequently the energy in the capillaries is largely converted into velocity. In proportion as you obstruct the outflow from the capillaries you increase the lateral pressure and diminish the velocity in them and consequently increase the transudation. In cases of vaso-motor paresis and in cases of cardiac failure the mass of blood in the capillaries of the dependent limb is augmented, the pressure is increased, and the velocity is diminished; consequently you get œdema.

THE VEINS.

The veins are smooth, capacious vessels, which practically offer no resistance to the circulating blood. They contain a certain amount of muscular fibre, and are supplied with some vaso-motor nerves, which maintain their tone and to some extent regulate their capacity. The great strength of the veins depends on the strong fibrous external coat. They are slightly elastic and attain their maximum distension at a low internal pressure; in this respect they differ essentially from their corresponding arteries. The veins have very flaccid walls and consequently readily adjust their cubic space to the amount of blood in transit. It has been shown by MacWilliam and by Leonard Hill that veins contract on mechanical stimulation or by cold and dilate by heat. The coefficient of elasticity increases with the internal pressure. The lateral pressure in the systemic veins depends on three factors—namely: (1) the obstruction to the inflow to the chest; (2) the hydrostatic effect of the column of blood; and (3) the potential energy transmitted through the capillaries. In the portal vein the pressure is always positive and in this respect it resembles an artery.

VELOCITY IN THE VEINS.

The blood in the veins is one of the very few things which run more quickly up the hill than they do down it. The velocity depends on the *vis a tergo* and varies enormously; in the veins of the arm it is frequently five times greater when the arm is hanging than when it is held horizontally at the level of the shoulder. The velocity is calculated by emptying a long piece of vein between two valves and then timing with a stop-watch the period it takes the blood to fill the empty vein. I have seen 23 centimetres of a vein in a dependent arm filled in 0·2 of a second, or a velocity of 115 centimetres in the second, a velocity as great as often occurs in the aorta. As in this case viscosity and friction can be left out of account, the only resistance to the flow was the retarding influence of gravity which can be easily calculated. The resistance would just equal the accelerating influence of gravity on a body falling *in vacuo* through a height of 23 centimetres, and from the formula $V = \sqrt{2gh}$, we know that this would equal a terminal velocity of 2100 millimetres per second. This is equivalent to a pressure of 230 millimetres of blood and equals the resistance, but in order to attain a velocity of 1150 millimetres in the second over and above the resistance of gravity, we must have a pressure which would give a velocity of 3250 millimetres in the second, which would be obtained by the pressure of a column of blood of 530 millimetres in height. The pressure-gradient in these 23 centimetres of vein would, therefore, be a fall from 530 to 300 millimetres of blood, or from 40 to 23 millimetres of mercury. This calculation was borne out by observation with a hæmometer. In these calculation, mercury is reckoned as 13 times heavier than blood. Where the resistance is *nil* a pressure gradient of five millimetres of mercury in a vein will give you a velocity of 1120 millimetres in the second. These observations show how kinetic and potential energy in every part of the circulation is constantly varying.

THE ARTERIES.

As the blood leaves the heart its energy is largely kinetic and therefore there must be very little lateral pressure at the commencement of the aorta during ventricular systole, but if the aorta be healthy a large portion of this energy is rapidly stored up in the elastic walls as potential which is paid out during the diastolic period and then the blood is compressed with a force nearly equal to that which it exercised, and this applies to all portions, including the commencement. The velocities of the blood in the aorta and pulmonary artery vary considerably in different individuals and in the same individual under different conditions. The velocity is directly as the cardiac energy and inversely as the resistance to the outflow and the sectional area. The force of the right ventricle is not a third of that of the left but the resistance is also not a third of that in the systemic vessels; the sectional area is only slightly greater, therefore the velocity in the pulmonary artery is nearly equal to that in the aorta.

In my opinion physiologists place too low an estimate on the velocity of the blood in the aorta, though no doubt their conclusions are based on many careful experiments, but experiments very difficult to carry out and very liable to great fallacies. Chauveau found that the velocity in the carotid artery of the horse reached 520 millimetres per second during systole, while at the time of the dicrotic wave the velocity sank to 220 millimetres per second and in diastole to 150 millimetres per second. In the human aorta the mean velocity has been set down as 320 millimetres to the second, while Professor Sherrington is a little more liberal with 500 millimetres. Now, a fall in the pressure-gradient in the aorta from 100 to 80 millimetres of mercury gives you a theoretical velocity of 525 millimetres per second. A clear comprehension of these questions of velocity and pressure in the aorta is essential for any true knowledge as to how stress and strain produce atheromatous and sclerotic changes in the vessels. There is no more important subject in the whole domain of medicine, as, after the age of 50, arterio-sclerosis, directly or indirectly, kills more people than any other disease.

We have seen that a pressure-gradient of five millimetres of mercury in a vein without any resistance would give a velocity of 1120 millimetres in the second, but in an artery, in order to get a velocity of 1120 millimetres you require a fall in the pressure-gradient from 150 to 100 millimetres of mercury. With a pressure of 150 millimetres and a resistance of 120 millimetres of mercury to the outflow you get a velocity of 640 millimetres in the second. With this velocity there is no excessive longitudinal strain on the vessel and provided the lateral pressure in the aorta does not exceed 150 millimetres of mercury the elasticity of the vessel may be preserved till old age. This ideal is not often realised.

When you get a continuous lateral pressure of 200 millimetres of mercury or more there is no period of repose for the vessels but merely periods of greater or less distension; there is interference with the circulation in the nutritive vessels, the vasa vasorum; you get irritative and proliferative changes in the subendothelial layer of the intima, atheromatous and perhaps calcareous degeneration follow, and the elasticity of the aorta becomes impaired. Oskar Klotz says that all the aortas examined by him coming from persons over 25 years of age showed more or less calcareous change in the aortic wall. In proportion to the loss of the elasticity the energy of the heart is not stored up and with the loss in the conservation of energy the heart has got more work to do in order to carry on the circulation and a great disparity arises between the systolic and diastolic pressures. In these cases the immediate resistance to the outflow from the heart is not increased but the total work is greater, the diastolic pressure in the heart rises, and the ventricle dilates and hypertrophies. The output is increased, the velocity is increased, and longitudinal straining—especially along the greater curvature of the arch of the aorta—takes place. When failure begins to set in you may find the force of this big powerful organ which shakes the whole chest only poorly represented at the periphery. In these cases the storage is defective, the pressure and the velocity are more or less intermittent, and there is an enormous waste of energy. In cases of very free aortic regurgitation the difference in the pressure-gradient and consequently in the velocity is often very great, the cardiac hypertrophy becomes extreme, and subsequent failure rapidly takes place.

This question of storage forms an important element in prognosis and for this reason aortic regurgitation occurring early in life from a rheumatic lesion when the aorta is fairly healthy is, *ceteris paribus*, very much less serious than a similar lesion arising secondary to degeneration of the aorta. If there be any elasticity left in the aorta and principal branches there is an advantage in aortic regurgitation in maintaining a relatively high diastolic pressure, because you thus make circulation more uniform and you do not necessarily raise the systolic pressure or increase the work of the heart. For these reasons well-regulated doses of digitalis and squills often do an enormous amount of good in this disease, notwithstanding the fact that many well-recognised authorities have entirely condemned the use of digitalis in aortic regurgitation, possibly because they did not know how to use it.

While a combination of these drugs increases the peripheral resistance—which is an advantage if moderate in amount—they lessen the size of the ventricle, increase the length and completeness of contraction, diminish the residual blood, and thus lower the diastolic pressure in the ventricles. In the present day it is a very common, and occasionally beneficial, practice to combine cardiac tonics with vaso-motor relaxants, such as digitalis and nitro-glycerine, but before combining opposing forces I think it is always well to have a clear indication in your mind as to the objects which you wish to accomplish, and the results which are likely to be attained. The circulation of the blood is one of the most perfect pieces of mechanism in the universe, and no amateur should be trusted to keep it in repair, yet American and English people pour tons of baneful drugs down their throats every year on the recommendation of advertising quacks, who care nothing for the lives and health of the community, and care for nothing but their money.

Arterial Blood Pressure.

During recent years an enormous amount of literature has been devoted to what has been euphemistically described as blood pressure. With one of the numerous blood-pressure instruments which are on the market it might seem a very simple matter to make an observation, but it must be remembered that it is not the instrument, but the man behind the instrument, who makes or mars the observation. The arterial pressure at the level of the heart depends on the force of the cardiac systole and the resistance to the outflow through the arterioles and capillaries. With a healthy heart or self-regulating pump the greater the resistance the greater the force of the cardiac contraction and consequently the higher the lateral pressure on the walls of the arteries. If the resistance be too great we may get cardiac failure and then the pressure falls. A long-continued great resistance increases the work of the heart, and work leads to hypertrophy which maintains the pressure at a high level. In a healthy aorta the coefficient of elasticity increases with the internal pressure, but long-continued strain impairs the elasticity and leads to degenerative changes in the intima. Roy considered that the maximum distensibility of an artery occurred under pressures corresponding more or less exactly to their normal blood pressure, but since then MacWilliam has shown that this is an error due, no doubt, to Roy unwittingly using arteries in a state of post-mortem contraction. MacWilliam has shown that the behaviour of an artery under varying degrees of internal pressure depends on the state of contraction or relaxation of the vessel and on the relative amount of elastic and muscular tissue.

When a person is in the horizontal posture there is still the same pressure-gradient between the systolic and diastolic pressures and in all the arteries of the limbs these respective pressures are about similar levels. The postural variations in pressure have been thoroughly investigated by Leonard Hill and placed on a true scientific basis. These variations are of importance not only from a physiological but also from a pathological standpoint. In arterio-sclerotic changes the arteries of the lower limbs are most involved, notwithstanding their muscular development and good vaso-motor nerve-supply. These arteries take part in raising the general arterial pressure and are also subjected to additional internal strain from the statical pressure of the blood; hence both the middle and internal coats are involved in the sclerotic changes.

In arterio-sclerosis the middle coat is chiefly thickened in the muscular arteries and arterioles which take part in raising the general arterial pressure, such as those of the splanchnic area, the skin, and muscles; while in those arteries which are not very muscular and are subjected to internal strain from both high systolic and diastolic pressures the intima is principally involved. Hence atheroma and calcareous degeneration are very common in the aorta and in the commencement of its branches, and in the coronary and cerebral arteries. The carotid arteries seem to occupy an intermediate position; they are muscular and very contractile, and are not specially liable to sclerotic changes either in the intima or the media.

In my writings on arterio sclerosis I entered very fully into the numerous causes which give rise to this disease, and the pathological aspect of the subject has been well investigated by Councilman, Cowan, Russell, Welch, and a host of others. A life of indolence and luxury is more deleterious to the circulation than the work of a navvy. I must not be supposed as recommending either course of life, but a happy mean with a strong leaning towards hard work.

The Heart.

No survey of the circulation would be complete without a reference to the self-regulating pump. The heart is composed of two physiologically distinct organs—the right and left heart. Each has got its own varying amount of work to perform and it, in normal circumstances, performs it without any assistance from the other, but in cases of stress or difficulty they mutually assist one another. They act together, and are set to the same time, but this does not prevent one side from beginning or ending contraction before the other, and so much so is this the case—and they are at least to this extent independent—that doubling of both sounds of the heart is one of the most common of cardiac phenomena. In a healthy heart both sounds are usually doubled every deep respiration.

Ladies and gentlemen, I have said enough to show you the necessity of a well-balanced circulation for the maintenance of life and health. It is only with healthy blood-vessels that anyone can hope to retain his mental and bodily vigour and expect to attain a green old age. Like the circulation, let us run with patience the race which is set before us. "Life every man holds dear, but the brave man holds honour more precious dear than life."

Address in Surgery

ON

THE TECHNIQUE OF OPERATIONS ON THE CENTRAL NERVOUS SYSTEM.

Delivered at the Seventy-fourth Annual Meeting of the British Medical Association on August 22nd, 1906,

BY SIR VICTOR HORSLEY, F.R.C.S. ENG., F.R.S.,

LATE CHAIRMAN OF THE REPRESENTATIVE MEETING OF THE BRITISH MEDICAL ASSOCIATION; SURGEON TO UNIVERSITY COLLEGE HOSPITAL, LONDON, AND TO THE NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN-SQUARE, LONDON, W.C.

[Sir Victor Horsley commenced his address by defining the limits within which he intended to speak. 20 years ago, he said, he had shown at a meeting of the Association the first three patients upon whom he had operated at the National Hospital for the Paralysed and Epileptic for intracranial disease. During the interval further experimental research on animals and clinical observations upon human beings had confirmed the soundness of the treatment that he then laid down; and in his address he proposed to analyse his cases at the National Hospital and to show that an accumulation of facts now afforded a ready answer to many important questions of diagnosis and prognosis. He continued:—]

THE RESPONSIBILITY OF THE SURGEON.

I must first briefly allude to the responsibility of the surgeon in the treatment of diseases of the central nervous system. As in all special branches of medicine and surgery which are in a process of evolution it is not easy to assign credit or blame when the course of treatment pursued is respectively successful or unsuccessful; but so long as our powers of diagnosis remain as imperfect as they are so long will the vulgar error of regarding surgical treatment as a *dernier ressort* be committed. This question—namely, When should medicinal treatment be given up and operative treatment substituted?—has been raised again and again and hotly discussed in connexion with many diseases, notably appendicitis. In 1890, hoping to secure a more logical and definite pronouncement on this fundamental point at the International Medical Congress, I proposed that in cases of Jacksonian epilepsy and other syndromata which suggested the existence of gross organic disease of the brain a definite probationary period of medicinal treatment should be agreed upon and that in an elementary case where no urgent symptoms like optic neuritis existed surgical treatment should be employed after thorough drug medication had been energetically applied for about six or eight weeks and cure had not appreciably resulted. No conclusion, however, was arrived at. Again, in 1893 I was unable to get an expression of opinion on this point, although Dr. Allan Starr in his well-known work on "Brain Surgery," has also formulated the conclusion that the surgeon should be invited to consultation in the case after about three months' medical treatment had been unsuccessful. Although such a course is in general the practice at the Queen Square Hospital, this view of the situation unfortunately has not yet been discussed in the profession. Even in the present year I have been asked to operate on a patient with a lateral tumour of the cerebellum who had been known to have optic neuritis for nine years, and last year I did operate on such a patient who had been known to have optic neuritis for 13 years. It is, of course, perfectly ridiculous to include such cases in surgical statistics purporting to be a scientific study of this subject, and I only mention them to show what extraordinary ideas still prevail of our responsibility towards the victims of diseased conditions when such happen to constitute what are termed new subjects in medicine and surgery.

Assuming now that in a given case surgical treatment is considered advisable, the question immediately arises for what precise purpose is it to be employed, for all treatment, medical or surgical, is either palliative or curative. These two aspects of the matter require separate consideration.

PALLIATIVE SURGICAL PROCEDURES.

It is a prominent characteristic of intracranial disease that (1) it is liable to produce optic neuritis, which customarily ends in total blindness; and (2) it may concomitantly cause severe headache and vomiting, all of which symptoms are dependent upon pressure and can be completely palliated or wholly removed by making a sufficiently free opening in the skull and dura mater.

Optic neuritis is a condition which, owing to its causing blindness, is of such vital importance to the interest of the patient, and so to the community, that it merits full attention. In 1886 its pathological causation was a matter of acute controversy, but we learnt by a very few years of operative surgical experience that, whatever other factors might be concomitant, the most important one in the production of optic neuritis was increase of the intracranial tension, and thus it happened that our earliest experience was the strikingly rapid subsidence of the optic neuritis when the skull and dura mater were opened. Therefore it is now possible to dogmatise on this question and to say that in no case of optic neuritis (not, of course, of toxæmic or anæmic origin) should the process be allowed to continue after it has once been diagnosed, and that if blindness results therefrom the responsibility is very heavy on anyone who fails to advise such a simple proceeding as opening the dura mater. As regards the procedure to be adopted, my own experience is that although in rare instances the neuritis may begin to subside after even the first stage of only opening the skull it is, as a rule, necessary to make a free opening in the dura mater to effect this purpose. One reservation must be made, that in cases where the tumour directly involves the optic tract the specially delicate anatomical structure of the optic tract may negative the attaining of this otherwise invariable result.

In predicting what will be the condition of vision after surgical treatment of the optic neuritis everything depends upon the care with which the ophthalmoscopic appearances of the disc are interpreted. Yellowish-white stippling, patches of exudation, or opal white atrophic changes, especially when associated with macular figures, all indicate that the secondary changes in the disc are likely to be permanent, and therefore in proportion to their development so the vision will be impaired, whereas when the loss of vision has been dependent simply on the swelling of the disc then not only is the sight saved but largely improved. For some further discussion of this most important point from the point of view of the ophthalmologist I would refer to Mr. Leslie Paton's recent analysis of the Queen-square cases which contains many of the results of my operations.

One more point must be mentioned in connexion with optic neuritis because although of more importance in diagnosis than technical procedure I find it is of the utmost value in indicating to the surgeon on which side he should operate. I refer to the localising value of the incidence of the optic neuritis. Varying statements have been made on this subject from time to time—namely, (*a*) that the optic neuritis begins on the side of the lesion; (*b*) that it begins on the opposite side of the lesion; (*c*) that sometimes one thing happens and sometimes the other according to the position of the lesion in the skull—for example, whether above or below the tentorium and according to the nature of the lesion. I wish to lay down the proposition drawn from an examination of my own cases of intracranial tumour that the optic neuritis commences on the side of the lesion. I am quite aware that true exceptions may yet be found to this rule, but I would point out that some of the exceptions hitherto described have not been real; that in any given case it is not a question merely of the number of dioptres of swelling of the disc, but it is also a matter of the anatomical changes in the disc; and, finally, that by the time the patient comes under observation the disc on the side of the lesion may be actually subsiding into decadent conditions at a time when the opposite disc is rising into its maximal swelling.

To sum up, then, during the past 20 years we have learnt that although the old procedure of de Wecker of incising the swollen sheath of the optic nerve in the orbit is of no avail we can with certainty avert blindness by opening the subdural space early in cases of intracranial disease. The opening is to be made preferably in the basal temporal region of the right side—that is, assuming that no attempt is made to attack the disease itself.

CURATIVE SURGICAL PROCEDURES.

If the operation is undertaken for the purpose of effecting a cure we have to consider (1) what is the nature of the disease; (2) what loss or aberration of nerve function it causes; (3) whether if the lesion be wholly extirpated there will be a recovery from the disorder of function; and (4) whether any loss which may have been present before operation will be made permanent by the necessary extirpation of particular regions of the brain. On points like the last it is evident that we cannot give a satisfactory opinion until we know precisely, first, what parts of the central nervous system alone contain the representation of movements or the record of sensation, and consequently of what parts does destruction entail permanent loss of function. In other words, we require to learn from the cerebral physiologist in what circumstances and to what extent can we get *compensation* of function when various parts of the (*a*) cerebrum and (*b*) cerebellum are destroyed.

(*a*) As regards the cerebrum, from the clinical records we can generalise that special motor functions cannot be restored if the whole of their cortical representation be removed. The same thing is probably also true of the special senses and certainly is true of the hemianopic representation of sight. Succinctly stated, this amounts to the generalisation that compensation is not possible after the destruction of middle level centres. (See Fig. 1.) The higher sensory representations and *a fortiori* the intellectual functions are, on the contrary, not permanently abrogated by the destruction of any one part of the cerebral hemisphere. The net conclusion, however, must be that as little injury as possible should be done and no more removed than is absolutely necessary, it being always understood that this does not apply to the skull but only to the nerve structures. The opening in the skull must always be free to allow of a proper survey of the brain.

(*b*) As regards the cerebellum, this question of compensatory power is no less interesting in the study of a homogeneous structure like the cerebellum, and has assumed a particular importance in the present subject because of Professor Frazier's proposal to extirpate the lateral lobe of the cerebellum in preference to pushing it aside by displacement for the purpose of reaching deep-seated tumours. My own experience is against such extirpations for convenience. In fact, I regard them as an unnecessary mutilation, though quite admitting that in the process of removing a large tumour in that region the cerebellum is considerably bruised when so pushed aside. I ought to add that although I have removed a considerable number of lateral recess cerebellar growths I have never found it necessary to do more than compress the cerebellum aside. (See Fig. 2.)

As to whether there is loss of function from such displacement involving bruising of the cerebellum I have followed up the longest surviving case that I could find in the Queen-square series—namely, one of cerebellar tumour and cyst combined, which I operated on 11 years ago, when the patient was a boy of 14 years. He is now a healthy young man of 25 years. In this case the tumour was a large one, situated in the right lateral lobe of the cerebellum, which was consequently markedly compressed, and probably the dentate nucleus of that side was also affected. The only indication of loss of physiological function that he now presents is a slight unsteadiness of the hand when he is particularly fatigued, as, for instance, after a long bicycle ride. He has plus tension of the normal cerebro-spinal fluid. As far as the cerebellum is concerned, whether this remarkable recovery is due to restoration of function of the bruised portions or to compensation from the uninjured part cannot yet be determined with certainty (I believe the former), but the conclusion I would draw is that we should preserve as much as possible of every portion of the encephalon which is not absolutely shown to be diseased.

At any rate, cases either cerebral or cerebellar dealt with on these lines show a remarkable power of recovery of function.

CONSIDERATION OF THE DETAILS OF OPERATIVE PROCEDURE.

(*a*) *Previous preparation.*—The general preparation of the patient by dieting, enemata, &c., is the same as for all operations. In a few instances I have found calcium chloride of probable service in cases where oozing from the bone or superficial tissues was to be expected, as in cases of penetrating endotheliomata of the skull. The head and cavities in relation to it having been thoroughly disinfected for two or more days with sublimate and carbolic acid, the patient is placed on the table in such a position that while the head is elevated to diminish the pressure in the venous sinuses the shoulders are also slightly raised, so that the glottic respiration is not interfered with. If the operation is to be on the cerebellum the patient is placed on his side with the uppermost arm drawn downwards. By these simple means complete access can be gained for any operation on the encephalon without subjecting the patient to constraint which affects both the circulation and the respiration. This question of posture of the head is no mere matter of convenience to the operator: it is an extremely serious one to the patient for the satisfactory performance of the operation and is only to be secured by having a suitable head-rest, such as the fork-rest of Professor Frazier or the one I use.

(*b*) *Anæsthesia.*—Of the general anæsthetic substances at our disposal, therefore, there are at the present time two for practical discussion—namely, ether and chloroform. Of these two, numerous experiments on animals in 1883–85 proved to me the striking disadvantages of ether, in spite of its greater safety, which it owes to its far lower physiological toxicity on nerve tissues. Apart from this specific difference the most important contrast between the two substances is due to their respective effects on the blood circulation. Ether directly causes, besides a rise of the blood pressure, a notable increase of the blood venosity and therefore much additional and troublesome hæmorrhage. In its later effects—that is, on recovery—it causes excitement, as well as in many cases notable headache and, of course, vomiting. Ether I regard, therefore, as inadmissible as an anæsthetic in operations on the central nervous system; but in saying this I must not be thought to be criticising my colleagues, especially American surgeons, who have accomplished most brilliant results under ether narcosis. Chloroform, *per contra*, causes a fall of blood pressure with relatively less blood venosity, although this is by no means absent, as will be seen below. It therefore does not aggravate the bleeding or embarrass the respiration by causing bronchorrhœa. Chloroform, however, as already stated, is more dangerous. It kills by paralysis of the respiratory centre as often as, or more often than, by paralysis of the heart, while all cases of increased intracranial tension (as is now well recognised) are liable to die at any moment from sudden paralysis of the respiratory centre. In the literature of the early days of cerebral surgery may be found instances of death on the operation table. I have no doubt that these were due to failure of the respiratory centre owing to a dose of chloroform having been given which, though perhaps not necessarily lethal in an ordinary case, was fully so to a patient whose bulb was hampered by previous tumour pressure. Chloroform, therefore, must be used with caution in the surgery of the nervous system to avoid giving a dose which might bring about fatal arrest of the respiratory centre.

The immediate problem is how to regulate the dosage of chloroform, and let me say in passing that the whole of my consideration of this question is applicable to all operations and not only to those on the central nervous system. Yet, curiously enough, because the early efforts of Snow, Clover, and others to obtain the administration of such a drug in known quantities were not entirely successful, the present haphazard and dangerous method of unknown dosage became customary and universal. At the original suggestion of Dr. A. Waller I obtained on July 10th, 1901, from the Council of our Association, the appointment of a research committee to secure data for the administration of chloroform in known doses, commencing with its precise quantitative determination. The results so far obtained have already proved of notable value. The committee has found that less than 2 per cent. of chloroform vapour in the atmosphere breathed by a patient is enough to produce deep narcosis and that a much smaller dose is required to maintain unconsciousness to pain. Various apparatuses have been devised to give known percentages of chloroform. Of these I have worked practically entirely with Mr. Vernon Harcourt's.

Much has been written on the subject of chloroform administration, but I must state categorically what I believe to be the most profitable way in which it can be used in operations on the nervous system and how its disadvantages can be mitigated or avoided. If the mask of the inhaler be made to fit by wet aseptic towels the amount of the dose

given will be under complete control. With the dose commencing at 0·5 per cent., and rising in from one to two minutes to 2 per cent., the patient ought to be ready for operation after from five to eight minutes. If the initial narcosis be complete no adverse event—for example, vomiting—will occur. If it be incomplete when operation is commenced various drawbacks will appear. This is, of course, well recognised as a general principle by anæsthetists, but is so salient a point as to deserve repetition.

Having now, by means of the Harcourt or other regulator, the power of giving known doses, we ought to arrange the narcosis strictly according to the nerve excitations it is intended to drown and so avoid contributing to the patient's discomfort by giving unnecessary quantities of the drug. As a rule, the amount of 2 per cent. is given for about five minutes before the incision of the skin and reflection of the flap which constitute the maximal pain period of the operation. This completed, the dose can be lowered by pushing the tap back and the bone be removed at 1 per cent. As the dura mater is a sensitive membrane supplied by the fifth cranial nerve the dose should be somewhat raised just previously to its incision to prevent reflex starts or movements on the part of the patient. As soon as the dura mater is opened the encephalon can be dealt with without causing any pain except if the course of the fillet or one of the peripheral sensory cranial nerves be accidentally irritated. Consequently all this part of the operation is done under less than 0·5 per cent. of chloroform in the air respired, an amount which, of course, is far below that required in the induction stage. Indeed, in many cases (the edges of the wound being as usual thoroughly protected by gauze) the chloroform can be entirely shut off, the longest period that I have been able to do this for being 20 minutes. This, however, was a case of a cerebellar tumour in a child and I have never been able in the adult to exceed 12 or 15 minutes before the return of the reflexes of the limbs necessitated the renewed administration of the drug. After the encephalic lesion is dealt with the percentage always should be raised to about 0·7 or even 1 per cent. to provide for the insertion of the sutures in the skin, as naturally that is a strong pathic stimulus. Finally, this percentage is continued to the commencement of the dressing to prevent the accident of vomiting occurring before the protecting rubber bib can be applied.

(*c*) *Maintenance of the body temperature.*—The general anæsthetic has, of course, a high degree of power to lower the temperature of the body and therewith to emphasise the shock of the operation. For this reason I think that all operating rooms should be at a temperature of not less than 75° F., and that the operating table should be provided with a suitable hot-water bed. While, however, cooling due to the anæsthesia can thus be readily combated, my experimental work of the last 20 years on both the carnivora and monkeys has convinced me that to maintain the physiological energy of the central nervous system and prevent shock thereto it is necessary during all operative procedures on the skull and its cavity to prevent cooling by radiation from the brain exposed in the wound. The wound therefore should be constantly irrigated, usually with a solution of sublimate of 1 in 10,000 strength, or with saline solution. These lotions are put into the irrigator at a temperature of 115°, the use of the hot irrigation fluid being not only to prevent cooling of the nerve centres but to arrest capillary and arterial hæmorrhage.

(*d*) *Hæmorrhage.*—The first general principle is the recognition of the fact, originally established by Cohnheim's researches, that as few vessels as possible should be obstructed; and, again, experiments on animals show that in encephalic surgery this principle must be followed as closely in the case of the veins as in the case of arteries. For instance, in the monkey the blocking of the large temporo-sphenoidal vein and the most anterior external occipital vein produces softening of the posterior part of the hemisphere. In pursuance of this principle, where it is necessary to remove large portions of the brain, the branches of vessels to be divided should be severed as far as possible from the trunk. A few points in detail must now be discussed according to the nature of the vessel.

From time to time it has been proposed to tie the main arteries—for example, the carotid—with the view of producing a large control of the blood flow from the cerebral arteries. But a thorough consideration of the cases in which this has had to be done by reason of operative necessities has convinced me that it is a measure to be avoided as far as it possibly can be. For instance, when ligature of the carotid has been found necessary in the case where a portion of the hemisphere has been partly displaced and compressed to gain access to a basal tumour, serious and even fatal secondary œdema and softening have proved the adverse influence of this proceeding. On the whole, I cannot suggest anything better than the original plan of tying all the arteries around the lesion before extirpating it; and inasmuch as all arterial supply of the encephalon is necessarily from below upwards, it is better to commence the excision of a lesion by beginning the incision in the brain below and carrying it upwards and towards the mesial plane.

Although it is necessary that every bleeding artery should be secured by ligature, it is remarkably easy to arrest capillary oozing and arteriole oozing from the brain by the simple means of hot irrigation. The temperature of the fluid should not exceed 115° F.—that is, about 46° C., but it must not fall below 110° F. or 43·5° C. If a larger irrigator be used it is practically an easy thing to keep the fluid at the desired temperature on account of its mass and it is gratifying, especially in a cerebellar wound, to see the oozing gradually cease during the steady flow from the irrigator "hose" pipe.

One of the most striking features of the physiological action of chloroform on the mammalian animal is that it soon (from 10 to 20 seconds) causes a marked fall in blood pressure. Consequently when a lesion is about to be extirpated and there is reason to expect considerable oozing, or when the brain is obviously turgid with congestion, I always ask that the chloroform percentage should be raised for, say, from a quarter to half a minute to 1 or 2 per cent. This at once induces a convenient, proportionate, and, of course, temporary anæmia.

The consideration of capillary oozing and hæmorrhage brings us logically to the question of bleeding from the venous system, because capillary oozing is so dependent on the venous pressure. The same steps, therefore, which diminish the latter will also reduce the former. All bleeding from the veins and sinuses in bone can be immediately and absolutely certainly arrested by plugging with wax if the periosteum round the hole is completely removed. No difficulty, therefore, should ever arise from hæmorrhage from this cause. It is otherwise with wounds of the sinuses and Pacchionian bodies and venous lakes in the dura mater. The bleeding from these, however, no matter how severe, is immediately controlled by pressure with the point of an instrument, while the opening is closed by a fine lateral suture on a round needle in the usual way. The principal veins if necessary are, of course, ligatured like arteries by passing a round needle beneath them, and there only remain, therefore, for consideration the control and arrest of venous oozing.

[Sir Victor Horsley here referred to the influence of oxygen in the control of venous and capillary oozing and then proceeded to discuss:—]

SHOCK.

Death occurring within the first 24 to 48 hours after the operation is from what is termed "shock." Since shock or sepsis are practically the only causes of death which can be provided against, the prevention of shock lies at the root of successful prognosis as well as of further improvement in surgical technique. I quite agree with Crile, who has done so much to elucidate this all-important question, that we should discriminate between shock and collapse; and that while collapse is a temporary accident in which the patient's nerve centres are capable of being revived by ordinary clinical means, shock, on the other hand, is a post-operative condition which deepens after the operation for a variable period and which if it terminates fatally destroys life, as a rule, within 24 hours. It is this dangerous phenomenon which we must now discuss.

From observation of the condition of patients after all kinds of operations it is evident that the phenomena of dangerous shock differ according to the part of the body operated upon, according to the condition of the patient before the operation, the concurrence of accidental hæmorrhage, &c. The alteration of the intracranial tension which is produced by opening the skull of itself necessarily causes shock after encephalic operations in a manner which is somewhat different from that caused by other operations. Therefore I think its treatment must also be different. The nervous system is responsible for the maintenance of the

respiration, the maintenance and control of the blood pressure, and for the maintenance and control of the temperature of the body. Hence the only way in which we can adequately examine into the subject is by systematic discussion of these several points.

Fortunately the clinical investigation of the first—the alteration of the intracranial tension—has been rendered more easy by reason of the procedures adopted during the last 13 years. In 1893, at the discussion in the Section of Surgery of this Association at Newcastle, I pointed out that the early statistics of intracranial operations showed that the majority of deaths occurred from a severe degree of shock which could be in great part avoided by dividing the operation into two stages, the interval between them being about five days.

The first stage consisted of the opening of the skull, the second of opening the dura mater and removal of the lesion. On the same occasion I also drew attention to the fact that, although at the second stage the dura mater was opened, the removal of the tumour was often attended by relatively little shock. Subsequent experience has fully confirmed these statements and shown that it is, in fact, the opening of the skull which causes most general depression of nerve energy and most alteration in the circulation.

[The lecturer then briefly dealt with the methods of opening the skull, pointing out that the indications were to employ little vertically applied force, and to avoid as far as possible all pressure on the brain and dura mater; he then passed to the next practical question—the influence of the region opened.]

ALTERATION OF INTRACRANIAL TENSION.

(*a*) *Influence of region of skull opened.*—This introduces a very important point which was first raised by Duret some 30 years ago and has attracted the attention of most surgeons who have more especially operated on the cerebellum. It is obvious that, inasmuch as the nerve centres of organic representation are situated in the posterior fossa of the skull, opening this region might theoretically be expected to cause more shock symptoms than the opening of other parts. No statistics can give a dogmatic explanation of this or any other clinical matter, and in fact every case forming the material for our present statistical analysis in which death occurred from shock after the first stage (six of the total number of cases) was complicated by the pressure of the lesion being only partly diminished, while in two instances there was, in addition, persistent hæmorrhagic oozing; but on taking all the cases together they give the following result, which is sufficiently demonstrative:—

	Proportionate ratio.
"Motor area"	1 death in 27 operations
Parietal and post-parietal regions	1 „ 19 „
Frontal region	1 „ 13 „
Temporal region	1 „ 12 „
Cerebellar region	1 „ 10 „

If, therefore, a line be drawn from the frontal eminences to the occipital protuberance it is obvious that more shock results from operations below that line than from above and also as we proceed from the frontal to the cerebellar pole of the encephalon. Duret's conclusion was that pressure applied to the frontal regions specially produced lethal effect by direct transmission to the medulla along an axis parallel to such a line and I shall show how such mechanical effects can, as far as possible, be avoided during operations on the basal parts of the brain.

(*b*) *Production of von Bergmann's œdema cerebri.*—The surgery of the central nervous system has been enriched by many contributions that have been made to it by von Bergmann, but on no point more particularly than that of the causation and frequency of œdema of the nerve tissues (see especially his "Kopfverletzungen" and later, "Die chirurgische Behandlung der Hirnkrankheiten," 1889, p. 118, *et seq.*). The readiness with which the cerebrum and cerebellum become œdematous is remarkable, but the circumstances in which it happens are not at all easy to understand and the facts of a large series of cases do not fall into line with von Bergmann's generalisation—namely, that œdema necessarily occurs whenever the skull is freely opened. Thus, after the second stage of an extirpation in which the skull has been very freely opened and a tumour removed there may be only a very moderate degree of œdema of the hemisphere operated upon, which, like all traumatic œdema of the brain, arrives at its maximum in from three to four days and disappears without any complication. On the other hand, when the skull has been freely opened in the first stage and the dura mater left intact, if the pressure of the growth is considerable, that may be accentuated by the development of a markedly œdematous condition around the focus of pressure. It is, of course, quite comprehensible that this is owing to the fact that a slight relative increase of tension may unfavourably affect the walls of the cerebral blood-vessels which are still under compression and bring about a Cohnheim effect. That this does occasionally occur is proved by the very rare phenomenon of translation of the red blood corpuscles into the œdematous tissue.

(*c*) *Exploratory operation.*—The statistics of the National Hospital for the Paralysed and Epileptic throw a good deal of light on this subject and show that unrelieved pressure is a matter of great practical importance in respect of ordinary palliative operations performed to abolish optic neuritis and relieve the headache—in short, to the procedure to which Professor Cushing has recently given the name of "decompression" operations. I will take this point now. Thus, of 13 cases which died from shock after the second stage, in seven by reason of failure of topographical diagnosis, the pressure was not relieved directly over the seat of the lesions, whereas in six cases in which a tumour of the brain was diagnosed and correctly localised, but in which removal was not attempted owing to the size of the growth and other reasons, no patient died. A comparison of this kind is sufficient, I think, to warrant the statement that the risk of an operation for decompression is greater if the opening for the relief of pressure is not made directly over the lesion. Precisely the same point is borne out with even greater distinctness by the figures showing the relative risk of operating with and without a correct diagnosis. Thus, of 79 cases in which a correct diagnosis was made and the tumour successfully removed, seven cases died from shock—a little over 8 per cent.; whereas in 16 cases of tumour which were incorrectly diagnosed, and consequently not removed, six cases died from shock—approximately 37 per cent. It is, perhaps, worth while adding that practically in all these latter cases the tumour was a glioma or gliomatous sarcoma—that is to say, a diffuse growth the diagnosis of which is always the most obscure, and at the same time a form of neoplasm in which circulatory changes and œdema are always liable to occur. I think that these data enable us to form a more or less correct estimate of the risk of an exploratory operation in cases of doubtful diagnosis.

TREATMENT OF SHOCK.

As I have suggested above, the treatment must be arranged according to the symptoms which threaten life, and those may be grouped according as they affect (*a*) the respiration, (*b*) the circulation, and (*c*) the body temperature. Depression or aberration of special nerve functions—for example, motion, sensation, &c.—need not be a source of anxiety, as if the centres of organic life are restored recovery of the others will certainly follow in proportion to the extent to which their representation has been preserved.

(*a*) *Respiration.*—The embarrassment of the respiratory centre in a stage of shock shows itself in increasing degrees of severity as follows: (1) shallowness of the respiratory movement; (2) periodicity and grouping of the respiratory movements; and (3) typical Cheyne-Stokes respiration. These changes are best dealt with by inhalations of oxygen until the effect of nutrient enemata (*vide infra*) begins to make itself felt, but it is above all in depression of the respiratory centre that strychnine is of use in combating shock. In speaking thus favourably of strychnine I nevertheless agree with the elaborate and useful work of Dr. Crile on this subject and believe that in many cases strychnine is used too empirically, too freely, or with undue reliance on its powers, and that in repeated doses it has a depressant action on the circulation. As a stimulant of the bulbo-spinal centres strychnine is, of course, unrivalled, and when any marked alteration in the rhythm of the respiratory centres shows itself a small dose should be given hypodermically, but for the above-mentioned reasons it does not seem advisable to give such a drug beforehand, as is sometimes done either immediately previously to the operation or at the end thereof, with the idea of anticipating difficulties resulting from shock. It is also not to be forgotten that the usual functional depression of the respiratory and the cardiac centres which immediately precedes chloroform vomiting is particularly marked in these operations and often causes unnecessary alarm.

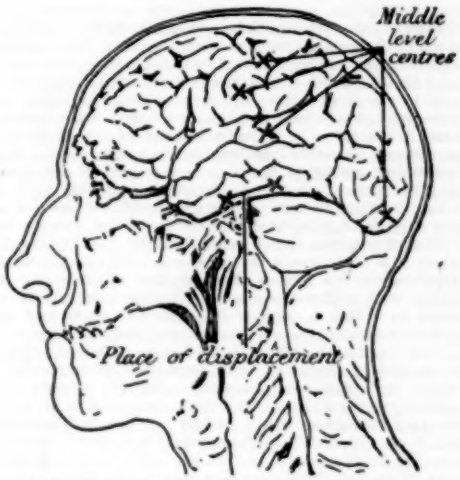
(*b*) *Circulation.*—In considering the depression of the

circulation by shock we must again express our indebtedness to Dr. Crile for having shown that this part of the subject is not merely a question of the central or cardiac maintenance of the blood pressure but to a large extent the lack of influence of the vaso-motor system. I think the beneficial effects of pressure on the surface of the body can be obtained by bandaging the limbs with cotton wool. It remains, therefore, to consider what drug treatment is to be resorted to. As regards cardiac stimulation, that has always seemed to me to be a clinical error. The heart does not require accelerating as a rule but it does require feeding. Undoubtedly repeated enemata (every two hours) of four ounces of beef-tea in which is dissolved Brand's essence or pancreatised milk are the readiest means of beginning to follow this line. If time presses a very small dose of atropine is useful and in cases of peripheral vaso-motor paralysis digitalis is also useful, but its use must be at once stopped if there is any acceleration of the pulse. It is, I believe, of universal experience that, compared to the foregoing drugs, alcohol is not worth mentioning, and as it has very definite depressant after-effects I think its use is to be avoided. A small quantity of strong coffee gives all the psychic stimulation of alcohol without its depressant effects and even if it be vomited within a few minutes benefit results.

(*e*) *Body temperature.*—In a large majority of cases the body temperature is somewhat lowered but in certain instances, notably in children, one of the shock effects of operation is the losing of heat control and consequently the temperature, instead of falling, rises from the moment the patient is returned to bed. This rise may in a child become hyperpyretically dangerous but can, of course, be, as a rule, like all neurotic pyrexia, controlled by cold sponging the upper limbs.

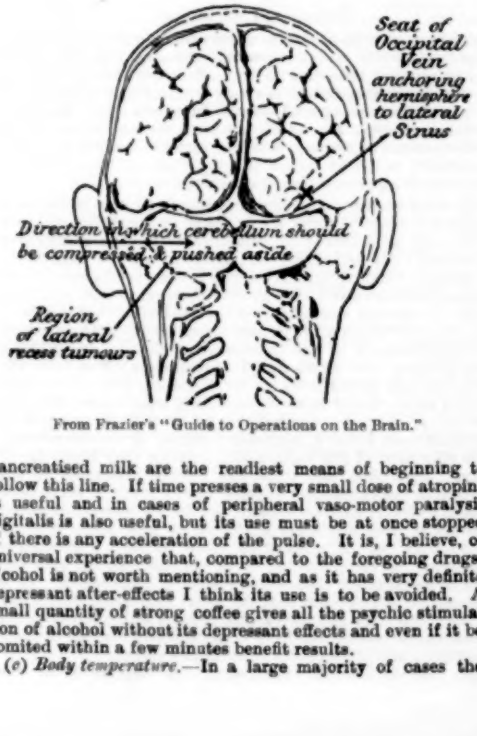
In leaving the question of shock I desire once more to assert that the main principle of operating on the central nervous system should be the avoidance and prevention of all conditions which lead to shock—namely, cooling and mechanical disturbance of the central nervous system. In respect of the necessity of producing less disturbance or chance of pressure upon the brain beneath, Mr. Spencer found in my laboratory that even slight pressure on the surface of the hemisphere materially affects, in accordance with the principles of Duret, the activity and regular function of the respiratory centre. So, too, in the second stage all the necessary instrumental procedures must be effected with as little pressure upon the brain and nerve tissues as possible. Sponging, for instance, should be avoided unless absolutely requisite; and, indeed, the practice of hot irrigation renders it very unnecessary. In particular, during the separation and extraction of an

FIG. 1.



From Frazier's "Guide to Operations on the Brain."

FIG. 2.


Seat of Occipital Vein anchoring hemisphere to lateral Sinus
Direction in which cerebellum should be compressed & pushed aside
Region of lateral recess tumours

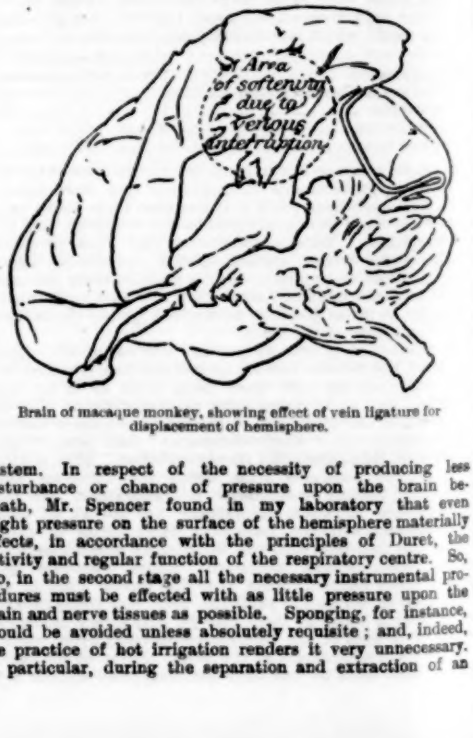
From Frazier's "Guide to Operations on the Brain."

FIG. 3.

2 large temporal vein 2
3. Occipital vein
Anterior Temporal vein
Direction of cerebellar veins
Place of Insertion of Spatula for displacement upwards to reach pituitary & other basal tumours

From Frazier's "Guide to Operations on the Brain."

FIG. 4.



Brain of macaque monkey, showing effect of vein ligature for displacement of hemisphere.

encapsulated tumour, every attempt ought to be made to exert a leverage or traction, so that the direction of the force is always outwards.

[These principles underlying the avoidance of shock having been fully discussed, we may turn to the question of septic infection, said Sir Victor Horsley, pointing out that when many surgeons can show an unbroken record of successful operations for the radical cure of hernia or for appendicitis in the cold stage it is not completely realised how very different should be our estimate of the proclivity of the central nervous system to invasion by septic micro-organisms and the extremely feeble degree of its resisting powers. Personally he believed that the present-day precautions are sufficient at the time of operation, especially if the irrigation fluid used be a weak antiseptic lotion; that for the subsequent dressings it is essential to use an antiseptic (he had only complete confidence in a mercury salt), and that so long as the cerebro-spinal fluid continues to escape the most vigorous disinfection of the skin and frequent changing of the dressings must be carried out. He concluded by re-asserting his view that the less drainage employed the better and consequently that every effort should be made to close the skin wound as early as possible. He continued:—]

DISPLACEMENT OF THE BRAIN.

With these general considerations before us there remains the discussion of particular procedures. One of the most important of these is displacement of the brain which must be resorted to to reach tumours at the base. I mean displacement of the lobes or regions. My first attention to this subject was drawn by being requested in 1889 to operate on a tumour pressing on the front of the optic chiasma and for this purpose I raised the frontal lobe but found that the tumour was really a cystic adeno-sarcoma of the pituitary gland and was inoperable. To facilitate the elevation of the frontal lobe some of the veins entering the longitudinal sinus therefrom were ligatured. On the death of the patient some years later I found that there was considerable softening of part of the frontal lobe in the area drained by these veins and not directly implicated by the tumour. This and subsequent evidence referred to above led me to the following conclusions, which I have repeatedly made use of and found of service, especially in ten cases of operation on the pituitary body. The cerebral hemisphere is anchored by emissary veins to the dura mater at various points (see Figs. 2 and 3): (1) in the mesial plane—that is, to the longitudinal sinus; (2) laterally, chiefly by the temporo-sphenoidal vein to the lateral sinus opposite the asterion; (3) to a less degree by the external occipital vein; and (4) by the anterior temporo-sphenoidal vein, both of which last are small vessels but being almost terminal require to be respected none the less. The hemisphere can be readily compressed upwards by inserting a flat spatula cautiously beneath it and between the veins just described. The next question, of course, is, What happens to the hemisphere compressed? This entirely depends on the mode of compression. If the compression is, as it should be, gradual, the soft nerve tissues soon mould, with very little internal derangement; but it is easy to produce, with too much and too rapid application of pressure, laceration of, and ecchymotic oozing between, the fibres of the corona radiata. Such compression contusions of the basal portions of the hemisphere are relatively unimportant, because they relate to portions of the cortex of which the function is either readily compensated when lost or of very wide representation. The inspection of the deep parts of the skull by displacement of portions of the brain entails trouble to the assistant, because it is certainly disadvantageous to move the retractor when once properly in position. So far I have spoken of the cerebrum. I think that precisely the same principles should prevail in the case of the cerebellum. With this procedure properly applied to the temporal lobe it is remarkable how much can be seen and correctly examined. With a good illumination the crura cerebri, the circle of Willis, the pituitary body and internal carotid, the second and third nerves come into view. I have in two cases after removal of a pituitary tumour inspected the base of the brain further by means of a small rhinoscopic mirror placed in the sella turcica; and it is very easy by continued but gentle pressure with a copper spatula, or with a spatula of suitable size and with a strong headlight, to inspect the lateral region of the cerebellum and medulla oblongata with the issuing nerves. (See Figs. 1 and 2.) For these reasons I venture to take exception to the step of removing portions and lobes of the encephalon if these impede the approach to the lesion.

THE VENTRICLES.

In this connexion—namely, procedures necessary for the examination of the deeper portions of the brain—a few moments must be devoted to the matter of exploration of the ventricles. Considering that for 1400 years (as we know historically) the lateral ventricles were looked upon as the most important part of the brain, inasmuch as the animal spirits, or, as we should now say, nerve energy, originated therein, it is not surprising to find that special danger was supposed to attend their opening or surgical interference. Undoubtedly their continued drainage exposes the patient to the particular risk of sepsis, but apart from this there is no reason why they should not be freely dealt with like other parts of the brain, opened and portions of their wall removed as the case may require, provided that one precaution is taken, namely that blood is prevented from flowing into the ventricular cavity. This, of course, may be obviated at the time of operation by a simple plug and when the removal of the lesion is completed a temporary tampon is left in for 24 hours, by which time all the oozing vessels are thrombosed. I may, perhaps, on this question draw attention again to my paper of 1893, because the case therein referred to of death by intraventricular filling was an instance of persistent oozing gradually forcing its way through the softened roof of the unopened ventricle.

PROCEDURES IN THE TREATMENT OF MALIGNANT DISEASE OF THE ENCEPHALON.

The analysis of the cases at the National Hospital for the Paralysed and Epileptic also brings out in very strong relief the fact that where the technique of intracranial operations fails most is the treatment of malignant disease. This, therefore, will fitly form the last chapter of our considerations. All tumours which, growing from the meninges, penetrate the brain, or which are encapsulated, such as fibromata, myxomata and endotheliomata, tuberculomata and gummata, can all be excised with a good permanent result. The comparison between simple and malignant disease is well shown in the accompanying table of 55 tumours, cases in which the patients' histories have been followed up to date.

Cases at the National Hospital for the Paralysed and Epileptic. Recurrence Table of 55 Tumours.

	Cases.	
Glioma ... ... 19 Sarcoma 4	23	Recurrence within 2 years, 20.
Endothelioma	8	1 recurrence 3 years later; died from heart disease, valvular. 7 alive well, longest 5 years.
Tuberculous ...	4	2 died within 3 months from tuberculous meningitis. 2 alive well, longest 7 years.
Gumma	8	No recurrence.
Fibroma	4	No recurrence.
Cysts	5	No recurrence.
Adenoma ... Pituitary Adeno-sarcoma	3	1 recurrence.

But unfortunately a considerable proportion of cases of cerebral tumour are essentially malignant and by reason of their diffusing through the nerve tissues are very difficult to deal with so as to produce a complete and radical cure. These are the gliomata or glio-sarcomata. One elementary point of difficulty arises from the fact that they not infrequently reach a considerable size before they produce sufficient symptoms to render a topographical diagnosis accurately possible. Further, pathological anatomy does not yet tell us how to classify these growths or how to determine what is their exact point of origin; consequently it is very difficult to attack systematically their growing focus or plan correctly the complete extirpation of the infected tissues. Further, the regions of the brain surrounding the tumour are commonly œdematous, and this introduces a fresh difficulty—namely, to decide between the infiltration of the brain tissue with neoplastic growth and with simple œdema respectively. The Queen-square series of cases in the foregoing table show that recurrence of malignant disease was observed in no less than 20 out of 23 instances. I have on several occasions attempted, with but very partial success, to obtain by extirpating such recurrences the same striking result as Bramann in his classical case, but undoubtedly the treatment of this class of disease will not be surgically satisfactory until the diagnosis is so far improved as to make it

possible to remove the growth entirely with certainty in the first instance.

EFFECT OF DIRECTLY EXPOSING BUT NOT REMOVING GLIOMATA.

In 1890—that is, 16 years ago—my attention was drawn to the remarkable progress of a case of glioma of the cerebrum which was referred to me by Dr. Buzzard for operation on the understanding that the operation should not be completed if the hemiplegia should be increased or made permanent. The tumour was found at the point diagnosed but it was so large that obviously its extirpation would have been followed by some permanent paralysis. The wound was therefore closed and the patient made a good recovery. Two and a half years later the patient accidentally infected himself with erysipelas and died in another hospital. At the post-mortem examination it was found that the tumour had disappeared, leaving a cicatricial and degeneration cyst. Since then I have operated on ten cases of similar nature but not always defining the tumour itself. In all, however, classical symptoms were present—namely, double optic neuritis, headache, vomiting, and varying motor and sensory paresis, together with severe intracranial tension and bulging of the brain through the opening of the dura mater. I may quote the two most recent of these cases.

The first case was that of a boy who was admitted into University College Hospital with left hemiplegia and Jacksonian epilepsy, optic neuritis, stupor, and vomiting. At the operation I found that at least the middle third of the cerebral hemisphere, principally the leg area, was involved in a dark red diffuse growth. Regarding it as inoperable I closed the wound, hoping that the tumour would undergo retrogression in accordance with the previous cases. This duly happened, and the boy is growing and is bright and intelligent. Examined on July 10th, 1906, two and three-quarter years since the operation, he seems to be normally healthy, except that there is a considerable degree of spastic hemiparesis of the left leg and to a less degree of the arm. Occasionally he has cortical twitching of the left leg. The second of these two cases is that of a medical practitioner, whom I saw in October, 1902, with all the symptoms of a rapidly growing malignant tumour of the left lateral lobe of the cerebellum. As this was apparently confirmed when I opened the skull and dura mater by the extreme turgescence and deep-red colour of the cerebellum, I closed the wound, considering that the original intention of palliation of the headache and neuritis was the only possible treatment. His recovery was, however, so complete that in a few months he returned to his practice, which he has been carrying on ever since. Cases of this kind are clearly comparable to those which Dr. T. R. Glynn has published of subacute encephalitis and internal hydrocephalus simulating cerebral tumour. It is, however, of course, difficult to determine the parallelism between his series of cases and mine, as only in one was an operation performed, but in that instance the relief of the cerebro-spinal fluid was followed by complete recovery.

I venture to think that we are justified in making the following general deductions on the question of the surgical treatment of malignant disease of the encephalon: (1) That operation should be resorted to as early as possible; (2) the tumour should be, if possible, freely exposed and examined and extirpated with surrounding tissue; and (3) that if it cannot be removed without undue interference with important or essential structures there remains some possibility of the tumour undergoing retrogression in a certain number of cases.

CONCLUSION.

In bringing this discussion of but one set of cases to a close some explanation is, I think, due from me why I did not follow the customary course of accumulating the records of as many cases as possible from the literature and basing my deductions on that basis. My reason is that the massing together of cases treated by different surgeons under different conditions of operative technique with different clinical histories has always seemed to me an unscientific proceeding. The errors of clinical observation are so numerous that to arrive at correct conclusions we ought to exclude variations of condition as much as possible. I have only now the very agreeable duty of rendering an acknowledgment of my sense of indebtedness to Dr. T. Grainger Stewart, the pathologist to the National Hospital for the Paralysed and Epileptic, Queen-square, Bloomsbury, who has with indefatigable industry worked out the clinical records of the cases on which this address is based.

Address in Obstetrics

ON

THE TEACHING OF OBSTETRICS.

Delivered at the Seventy-Fourth Annual Meeting of the British Medical Association on August 21st, 1906.

BY W. S. A. GRIFFITH, M.D. CANTAB., F.R.C.P. LOND., F.R.C.S. ENG.,

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MR. PRESIDENT, LADIES, AND GENTLEMEN,—May I be permitted before entering on the subject proper of this address to make a brief reference to the addresses delivered by my predecessors? They are few in number and appear to have been given only on exceptional occasions. That this should be one of those special occasions has been wisely determined by the council of the Association and they have placed on me the responsibility of endeavouring to make some adequate use of the opportunities which such an occasion affords.

The first, and in some respects one of the most interesting, of these addresses was given at the thirty-first annual meeting of the Association, held at Bristol in 1863, by Dr. J. G. Swayne, physician-accoucheur to the Bristol General Hospital and lecturer on midwifery at the Bristol Medical School. Of the many subjects discussed in that address, the obstetric use of chloroform, version in cases of obstructed labour, the treatment of placenta prævia, Cæsarean section, blood-letting and chloroform in puerperal convulsions, the nature of thrombosis and of phlegmasia dolens, and the operation of ovariotomy, almost all are still matters under discussion. As regards the obstetric use of chloroform Dr. Swayne said that although it had been used for over 15 years authors were not agreed as to the extent or the frequency with which it should be administered, and in reading his arguments for and against the use of chloroform we can see that medical men at that time had not learnt how to administer it in such a way as would insure to the patient the needful relief from suffering while interfering as little as possible with the normal action of the uterus. He concluded by saying that in normal labour especially he would not administer chloroform but would rather let well alone than interfere with the course of nature. Apparently very many practitioners of to-day agree with his views, and not having been taught the proper method of administration they allow many a patient to suffer severely during labour without affording them the relief that chloroform can give. Many of us will agree with him in his conclusions as to the treatment of placenta prævia—namely, that the method of version and extraction by the feet must after all be our main resort, being that most often suitable and, be it added, successful. The cases which are exceptional and require other methods are those in which the difficulty of dilatation of the cervix is considerable. Of the other subjects which he discusses, that of the operation of ovariotomy (then still in its infancy) must interest us particularly. Here are seen some of the pioneers of this operation: Spencer Wells, Baker Brown, Tyler Smith, and Clay, with the results involving a mortality in selected cases of from 50 to 30 per cent. Dr. Tyler Smith, then President of the Obstetrical Society of London, whose papers will be found in the third volume of the Transactions of that society, is quoted as having had seven recoveries out of 12 cases and that "one of the most remarkable features in these cases was, that in two of them the pedicle was tied with a silk ligature, the pedicle and ligature being cut as short as possible and dropped into the abdomen without producing any bad results."

The address in 1884 was given by Dr. G. H. Kidd of Dublin at the meeting at Belfast. The subject was Puerperal Fever, treated chiefly from the clinical point of view. While rightly exposing the fallacy of the theory of scarlet fever as a cause of puerperal fever, he refused to admit the general septicæmic theory because it did not include groups of cases which he supposed due to a specific epidemic disease. The 22 years which have elapsed since that date have brought evidence which convinces all who study the matter under favourable conditions that the cases commonly grouped under

the head of "puerperal fever" are in the main cases of septicæmia arising as the result of infection introduced from without in connexion with the process of labour and the lying-in, and that this septicæmia is to be prevented by the prevention of this infection. In addition to this, the principal group, there remains a small fraction of cases in which the infection, although introduced from without originally, has remained almost dormant within the body until labour has provided the opportunity for its extension. The theory of a specific epidemic disease has vanished.

The next address was delivered in 1893 at Newcastle-on-Tyne by our revered colleague, Dr. C. J. Cullingworth, who is occupying his leisure from active hospital work by editing the *British Journal of Obstetrics and Gynæcology*. The subject was Pelvic Peritonitis in the Female and the Pathological Importance of the Fallopian Tubes in connexion therewith. The address remains as a landmark in our knowledge of the pathology of salpingitis; it led to the general appreciation by British gynæcologists of the true pathology of perimetritis, as well as to advances in abdominal surgery in the treatment of these cases.

In 1900 an address was given at Ipswich, where I had the honour to be President of the Obstetric Section, by our friend Dr. W. J. Smyly of Dublin, whose work at the Rotunda Hospital is well known to you all, and who has since received the well-deserved honour of knighthood. The subject was Maternal Mortality in Childbed. Its chief importance as a landmark is in its indication of the simplification of antiseptic measures for the protection of parturient women, as, for instance, the abolition of the douche as a routine practice, and in its insistence on the substitution as far as possible of external or abdominal for internal or vaginal examinations during labour. Sir W. J. Smyly does full justice to the pioneers in the fight with puerperal fever, but like Dr. Kidd, and indeed other writers until quite recently, he does not mention the astounding evidence collected by Oliver Wendell Holmes, whose essay on the contagiousness of puerperal fever was placed in my hands by a non-medical friend in my first year as a medical student and has ever since remained in my memory. The profession is indebted to Dr. Cullingworth for having reminded them of the great service which Oliver Wendell Holmes rendered, though with so little immediate fruit.

At the meeting at Manchester in 1902 Professor Sir William Japp Sinclair discussed Carcinoma in Women, chiefly in its clinical aspects. In this address he expressed his firm conviction that the secret of cancer will be discovered (if ever it is) by the study of cancer of the uterus, although his reasons for this view are not very clear. He is less pessimistic with regard to the results of vaginal hysterectomy than many operators and was not at that time in favour of abdominal hysterectomy in these cases.

Such an address as I am requested to give on this occasion should, if possible, deal with some point of general importance and interest rather than of personal investigation or experience, and I can imagine none at the present time so important to the present and future members of the Association as the efforts which are being made to improve the teaching and training of our medical students in practical obstetrics. The faults of our methods of teaching are obvious to every thoughtful person. The difficulty in adequately removing the deficiencies is undoubtedly very great. May we first consider some of the most obvious imperfections? These are for the most part due to the difficulty of providing practical clinical teaching. There is no large maternity hospital in London capable of accommodating the students of the various medical schools, for the four lying-in hospitals are primarily charities for the relief of poor women and training schools for monthly nurses and midwives. Queen Charlotte's is the only lying-in hospital which admits medical students or qualified practitioners to its practice. The students, however, who take the month's course obtain clinical teaching and experience of a kind not to be obtained easily elsewhere, but unless the hospital is prepared to give up its principal work—the training of midwives and monthly nurses—in favour of the medical students, its 70 beds, accommodating 1600 in-patients in the year, can only provide the necessary experience for a small number of the students of London. At the present time the practice is attended chiefly by qualified men who, having found out their lack of experience, are glad to make use of the opportunities for instruction to be obtained there. The other three lying-in hospitals provide between them 100 beds but they do not at present admit medical students. So far as teaching is concerned their work is limited to the training of midwives and monthly nurses. The number of women from all parts of the country seeking to be trained as midwives is continually increasing and to meet their requirements the capacity of these lying-in hospitals is fully taxed. All the medical schools and lying-in hospitals have an extern maternity department and in this department the students, under more or less organised supervision, attend poor women in their own homes. Even in the best organised of these maternities the supervision and instruction of the students are very inadequate, for the resident medical officer in charge of them is without that constant guidance and close personal contact with his chief which fall to his lot when working in the wards of a hospital. It is impossible for it to be otherwise and it speaks well for the general standard of practical common-sense that so few calamities occur. When attended by students *who have had the necessary preliminary clinical teaching* these extern maternities provide the most important and valuable training that any medical student can obtain, for, as in private practice, he is then placed almost entirely on his own resources. At any time he may have to deal with one of the sudden emergencies of midwifery, and so he begins to acquire that feeling of personal responsibility for the direction and management of the case which it is so difficult to arouse in the student while at work within the hospital where every important detail is supervised by the responsible officers. Thus, invaluable training is at hand for every student in the maternity districts and their responsibilities in degree and in value are not exceeded by those of any house surgeon or house physician—offices which can only be held by a small minority of the best students.

Another factor which has delayed the provision of adequate teaching in obstetrics, not only in England, but probably in other countries, is the old ingrained idea that the process of labour is a simple function of nature, requiring for the most part a competent nurse only, and that the practitioners of obstetrics, although recognised in theory as of equal standing, are to be looked down upon in comparison with their colleagues in the other great branches of medicine and surgery. As the result of this, both in teaching and in examinations, the study of obstetrics has been relegated to a position totally unworthy of its immense importance to the practitioner and to the national welfare.

As Dr. W. R. Dakin pointed out in his excellent inaugural address before the Obstetrical Society of London last year, if only the scourge of puerperal septicæmia can be removed childbed will be robbed of one of its principal terrors, and this long-desired consummation will be nearer its accomplishment when our students are taught practically in the lying-in wards the application to midwifery of the general principles of antisepsis.

As shown in the report of a committee of the General Medical Council just published it is still common in many places for students to be permitted or even encouraged to attend their maternity cases before they have had any adequate instruction in those general principles of medicine and surgery upon which the whole practice of obstetrics is based.

Another defect in the teaching is due to the fact that the lecturers frequently have had little experience in the practice of obstetrics. It is considered essential for the lecturer on medicine, surgery, or indeed any other special subject, to be a man of wide clinical experience and to be in charge of wards devoted to the care of patients suffering from those particular diseases upon which it is his duty to lecture. In obstetrics it is otherwise; the lecturer presides over no obstetric clinique and has often had but little experience. He is an obstetrician in name, not in practice. He probably does not attend 20 cases in a year. His obstetric practice is limited to the few special cases to which he may be called in consultation and his teaching is necessarily of the book, not controlled by that wide personal experience only to be acquired by the constant observation of large numbers of cases such as falls to the surgeon, the physician, or to himself as a gynæcologist in the course of their daily work. They, however, aim at and attain a high standard of theoretical teaching and all credit is due to the men who under these very imperfect conditions have done such admirable work as teachers and investigators. In many of the provincial schools the lecturer is a successful general practitioner, to whom the Fates have given a large obstetric experience, but whose scientific training for this work and whose experience as a teacher may have been quite inadequate.

It is essential to have a scheme which shall place the

teaching of obstetrics upon the same basis as the teaching of medicine and surgery. To devise such a scheme is not difficult, but to render it practicable within a reasonable time must be a matter of considerable expense and difficulty. It is in the first place essential that the clinical teaching be given in hospitals provided for the purpose, where a sufficient and continuous series of patients can be admitted, and having as at present a large extern department where the advanced students can attend patients at their own homes. Lying-in wards in a general hospital would be equally valuable if there were a sufficiently large number of beds to insure a regular series of patients in sufficient numbers. A small ward with a few beds is quite inadequate for routine teaching, although of great value for the admission of special cases. A large number of cases is less of a necessity than a continuous series, and I am convinced that it is of the greatest advantage to teachers and pupils that medical students should be taught their duties at the same time and place as monthly nurses and midwives. If taught separately the average student learns little of the many things every nurse knows well, and the nurse of a few months' training thinks she knows a great deal more than the medical man, and does not realise the wide gulf that separates her knowledge and practice from that of the properly trained medical men. Both student and nurse will in the wards have been taught together how to carry out their respective duties in the best manner with all the appliances and assistance which can be provided there, and in passing from the wards to the out-patient department they will learn how to carry out those principles in the simplest manner, and often enough with little to assist their wits and their fingers in dealing with the lesser emergencies which they will meet with.

Every clinical teacher of obstetrics should be a practitioner of obstetrics having charge of the obstetric wards and extern-maternity department, whose office as professor or lecturer would necessarily terminate with the cessation of his clinical duties. This arrangement would usually lead to the devolution of the greater part of the obstetric teaching to the younger members of the medical staff, with great advantage to them as well as to the students. They would have more time for visiting and clinical teaching in the labour and lying-in wards and to devote to the pathological work of their department which the older physician busy in practice may find it difficult to do.

Owing to the great difficulty that there is in providing the necessary funds for the maintenance and development of the existing hospitals, supported as they are by the voluntary contributions of a comparatively small proportion of the community, it seems hardly possible to expect that adequate accommodation can be provided in this manner in the near future, whether by the extension of the lying-in hospitals or provision of suitable wards in the general hospitals or by the foundation of new hospitals. All these are urgently needed and will require the expenditure of large sums of money. When we look at the splendid provision made for patients in the great public asylums and fever hospitals we shall be pardoned if we are inclined to look forward to a time when the great hospitals of the country shall be relieved from the eternal difficulty of finding the money necessary to pay for their daily maintenance and when we shall see them equipped in an equally suitable, though perhaps less expensive, manner by funds provided by the State, administered by the existing board of managers, under the general supervision of a responsible central hospital board or commission.

The practice of obstetrics consists of the practical application of the ordinary principles of surgery and medicine to special organs and to special conditions and yet, as stated in the report of the Midwifery Training Committee of the General Medical Council already alluded to, in 23 out of 37 medical schools students are allowed to attend midwifery practice before they have received even an elementary training in the principles of medicine and surgery. All obstetric physicians who have to teach know well that it is impossible to instruct such students with any enthusiasm, however willing the students may be to learn. The action of the General Medical Council in appointing this committee is a very important step in the right direction. The recommendations are in the main excellent and are now being considered by the various teaching bodies. They are—that every student be required to have conducted no less than 20 cases of labour, subject to the following conditions:—

A. Before the student is allowed to conduct the above-mentioned 20 cases of labour he should be required to have held the office of clinical medical clerk and of surgical dresser; to have attended a course of lectures in medicine, surgery, and midwifery; to have during one month given undivided attendance upon the indoor practice of a lying-in hospital or the lying-in wards of a general hospital; and to have therein attended cases of labour under the direct supervision of a medical officer of the hospital. He should further be required to produce a certificate from the authorities of the hospital showing that he is competent to undertake the conduct of ordinary cases.

B. No certificate that the student has conducted the above-mentioned 20 cases of labour should be accepted unless it is given by a member of the staff of a lying-in hospital or of the maternity charity of a general hospital.

These recommendations, when they can be rendered practicable and can be enforced, will meet some of the most important deficiencies suggested in this address. They will insure that the student has had a considerable part of his training in medicine and surgery and elementary obstetrics before the required 20 cases of labour are commenced; and that he will have had the same practical demonstrations and clinical instruction in the wards of the lying-in hospitals or in the lying-in wards of the general hospitals as he receives in his surgical and medical training.

The changes indicated in Paragraph B may be thought to inflict some hardship upon individual students, for at the present time the requisite certificate of attendance upon 20 cases of labour may be given by any registered practitioner. But it must be remembered that under the existing regulations the certificate affords no evidence that the student has received any instruction whatever and there is reason to believe that such indeed is sometimes the case.

While it is perfectly clear that there are many general practitioners able to give excellent instruction in some of the details of practical midwifery, it is equally certain that there are many others whose methods of practice, especially in the disregard of aseptic precautions, would make them dangerous teachers and would lead to the continuance of methods which tend to the perpetuation of the still high mortality from puerperal fever. The difficulty of making any selection in these circumstances would be very great and there is no satisfactory alternative but to adopt the course which is universally followed in the teaching of surgery and medicine—namely, to require that instruction be given by recognised teachers selected from the hospital staff for the purpose and that the instruction in practical midwifery necessary for qualification be given only by recognised teachers.

The regulation at present in existence which demands that the student shall attend courses of systematic lectures is also faulty, since it involves unnecessary labour to the lecturer and makes too great a call on the time and attendance of the student. This remark, indeed, applies to almost all systematic lectures as delivered at the present time, and many of us think that the time has come when the arrangements for such lectures need thorough revision. The great extent and variety of the subjects, on the one hand, and the excellence of so many of the text-books, on the other, make it desirable that the greater branches of medicine and surgery be taught in sections rather than in a continuous course of 60 or 80 lectures. In obstetrics the usual plan is to give a course of lectures extending over three months and delivered on four or five days in the week during the summer session; this course the student is expected to attend, but it is often quite impracticable to arrange a time for the lectures which shall permit anything like the whole number of the students to attend without interfering with their other duties, and unless (as is the case in the larger schools) a tutor is appointed to supplement these lectures by classes held at short intervals, a student may get little or none of the higher instruction which it is essential for him to receive. The lecturer on his part has year after year to spend a considerable portion of the time given to his lectures in teaching the anatomy and physiology of the female generative organs, both in the normal and gravid conditions, before he can begin teaching obstetrics proper—namely, the anatomy and physiology of labour, the management of pregnancy and labour, and the science and practice of the various complications that may arise.

It is a curious custom, but apparently a common one, for the lecturers on anatomy and physiology to omit from their systematic courses the female generative organs; hence the student learns but little of female pelvic anatomy and of such a highly-important subject as the physiology of menstruation until he attends lectures on obstetrics and gynæcology. Before attending his cases and acquiring some degree of practical acquaintance with the process of labour the student is not in a position to appreciate or even to understand much of what he hears in a course of systematic lectures. It would be better if the instruction he received

before his attendance upon labours were limited to the management of normal pregnancy, labour, and the puerperium, together with such complications as are common. Instruction of this kind could well be given by the demonstrator and would clear the ground for the lecturer on obstetrics, leaving him free to devote more time to the graver complications and more advanced work. The student also at this later stage of his career would be in an infinitely better position to appreciate the value of this advanced teaching.

Another method of instruction, and one likely to be keenly appreciated by advanced students, is the delivery of clinical lectures upon cases recently in the wards. Hitherto, owing to the absence of lying-in wards, such lectures have seldom been delivered. Amongst the many able and learned obstetricians in London who have from time to time endeavoured to raise the standard of teaching there is probably no one to whom we owe so much as to the late Dr. Matthews Duncan. He came to London to fill the vacant post of obstetric physician at St. Bartholomew's Hospital in October, 1877, and from the first devoted a large portion of his time and his great experience, and gradually his affection also, to his wards and his students. A "Scotsman of the Scots," he came to London believing that there was little of value to be found South of the Tweed. He gradually transferred his devotion from Edinburgh and Aberdeen to London and St. Bartholomew's. He would go to Scotland for his holiday but came back to London for his work. His influence at the hospital may be summed up in the statement that by his teaching and example he transformed the teaching of obstetrics and gynæcology from an almost insignificant position to one of the greatest importance. This change was soon felt, not only by his colleagues on the staff of St. Bartholomew's but by the students and junior officers who flocked to his lectures and wards to learn from his example that the practice of midwifery and gynæcology could be as noble and as full of dignity as that of the highest standards of surgery and medicine. This transformation was due not only to his learning and greatness as a teacher and to his success as a leading consultant—both of which were sufficiently recognised far beyond the limits of St. Bartholomew's and even of London itself—but also to the greatness of character which made it impossible for anyone to be brought in contact with him, either in hospital or palace, without feeling that the branch of the profession which he practised was as noble and dignified as that practised by the greatest physicians and surgeons. In this respect, as in the high standard of his teaching, his example diffused itself in every direction, and it is no injustice to other great teachers of his time to say that it raised the whole standard of teaching obstetrics and gynæcology throughout London. It is difficult to say whether he excelled most in his systematic or clinical lectures. Students who regularly attended his systematic lectures received a course of instruction which by its completeness rarely left any matter of importance—however recent a contribution or emanating from whatever country—lacking in their knowledge of the subject. Illumined with the criticism of his clear, highly-trained, logical mind, they were enabled to discriminate what was of permanent value and what they might expect to lay aside with fuller knowledge. His clinical lectures were models of what such lectures should be. No student could help keeping his attention fixed on the subject. No mass of detail was allowed to obscure the clearness of the main object of the lecture, so that every one carried away some important principle clearly impressed on his mind, while to the more advanced student in gynæcology the facts grouped round the main thesis (the importance of which was not always perceptible to the elementary student) afforded him further instruction, the value of which rose in proportion to his knowledge of the subject and his experience as a practitioner. The influence of such a man who combined the highest personal qualities with knowledge, experience, and clear judgment, not only in the ward and classroom but in every relation of life, raised the standard of the science and practice of obstetrics and gynæcology to a position which, at least in London, they had never before attained.

THE SEWAGE OF TAVISTOCK.—At a special meeting of the Tavistock (Devon) urban council held on August 15th a tender was accepted for £4544 for carrying out a sewage disposal scheme for the town.

SOME OBSERVATIONS ON THE EFFECT OF STERILE CASEOUS MATTER IN THE TREATMENT OF TUBERCULOUS DISEASE.

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I WISH to direct attention in this preliminary paper to a few observations which I have made on the effect produced in tuberculous lesions by the injection of some of the products of the tubercle bacillus as elaborated in the body.

It is well known that tubercle bacilli can easily be found in the walls of tuberculous abscesses but in the contents they may be so few that inoculation experiments may be necessary to demonstrate their presence. The conditions in the interior of such abscesses are apparently favourable to growth; the serum and soluble toxins pass into the circulation, producing more or less constitutional disturbance, whilst there is a stream of fresh serum, rich in nutritive substances, into the interior; the temperature is most suitable, and still not only do the bacilli not increase but actually diminish in numbers. There must, then, be some substance in the contents which is inimical to the bacilli and, as the fluids are being constantly renewed, presumably this deleterious material is in the encapsulated solids.

The conditions which exist in an abscess, as regards the relative proportion of caseous matter, cannot be produced in the body as a whole, still the possibility remained that the introduction of small quantities might exert a beneficial influence on the disease. But before such injections could be made it was necessary to destroy the living bacilli present, for though these may be so few as to escape notice with the microscope, inoculations show that even in these cases they are present. As it was requisite that the chemical constitution of the solids should be as little changed as possible it was evident that neither heat nor chemicals could be used for the purpose of sterilisation, and extreme cold, even though applied continuously for a long time, does not affect the virulence of organisms. Cold applied intermittently was found to produce the desired result. If tuberculous pus be kept in a refrigerator for five or six months, but allowing it to thaw frequently during that time, the pus will not induce tuberculosis when injected into guinea-pigs, even in large doses. Having destroyed the bacilli by this means the serum is poured off and the sediment is then washed for three days in a continuous stream of cold sterilised water to remove all soluble toxins. Sterile normal salt solution is now added to the fine white sediment till each cubic centimetre of the emulsion contains five milligrammes of solid substance and the material is then ready for use. Large numbers of animals have been injected with this suspension and in no instance has tuberculosis been produced. If a large quantity be injected into a tuberculous patient there is a well-marked reaction but a few minims can be given without any evident disturbance. If the opsonic index is to be regarded as the degree of resistance of the body against any particular organism then we have in this substance a means of raising the tuberculous index to a high level and that without any negative phase. In one of my patients this index rose from 0·5 to normal limits within 12 hours. Such a rapid rise is unusual but there is no difficulty in raising the index to what is regarded as normal and in maintaining it at that level. The technique necessary to obtain this index is so elaborate that it can only be conducted in a fully equipped laboratory and by a properly trained observer, and so long as it remains in this position it can only be employed in a limited number of cases. In using caseous matter I have found the temperature a convenient guide to the dose. If sufficient be introduced to raise the temperature from 0·5° to 1° the best results are obtained and at the same time the index keeps within normal limits. If there be no rise of temperature the index may still be high and yet little, if any, improvement be observed in the disease. I have found that from 0·1 to 0·5 cubic centimetre of emulsion given every second day is sufficient to raise both index and temperature. I begin with the smaller quantity and increase the amount at each injection till a slight reaction appears. The following

is a short summary of several cases in which this treatment has been tried.

CASE 1.—The patient was a girl, aged eight years, with old-standing hip-joint disease. The joint was ankylosed and a sinus led from the outer side of the thigh up towards the joint. The skin round the opening of the sinus was extensively and deeply ulcerated. The sinus closed and the ulcers healed with four weeks' treatment.

CASE 2.—The patient, a boy, aged nine years, had tuberculous disease of the left clavicle, the left tarsus, and the right fibula. The left foot had been amputated and the fibula destroyed for about five inches before the treatment was commenced. When the injections were started there was a long open wound over the fibula and a sinus, discharging pus, over the clavicle. These were healed within five weeks after the injections were commenced.

CASE 3.—The patient was a girl, aged 14 years, with disease of the synovial membranes of the wrist-joint which was discharging through two sinuses. After seven weeks' treatment the swelling had disappeared and the sinuses closed. The movements, though improved, are still restricted.

CASE 4.—The patient, a woman, aged 22 years, had lupus of both cheeks of 12 years' duration. The patches were covered with small superficial ulcers and the edges consisted of a zone of firm papules. These were healed after two months' treatment, though their outline still becomes red when the patient is excited.

CASE 5.—The patient was a woman, aged 35 years, with chronic pulmonary tuberculosis. Both apices were diseased and with cavity formation. Cough was troublesome, expectoration was moderate in quantity, and bacilli were numerous. With three months' injections the symptoms have greatly improved. The râles have quite disappeared from the left apex and nearly so from the right. The cough is very slight and only for a little while in the mornings. There is almost no expectoration and the bacilli have been absent for two months.

These cases, though not by any means conclusive, are at least encouraging and justify further investigation.

Glasgow.

UPON AN ANTI-CHOLERA SERUM.

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IT is generally accepted that the symptoms of cholera Asiatica are the result of an acute intoxication with certain products of the specific agent—the comma bacillus of Koch. Further, that these symptoms are due not to a general invasion of the body by the bacillus but to an absorption of its toxins from the seat of infection—the intestine. An intoxication being the cardinal feature in the disease the character of the specific poison became naturally a subject of close investigation, and more than one attempt has been made to isolate it and to bring the treatment of cholera within the range of serum therapeutics. Little hope of success has been found to lie in the preparation and the use of a bactericidal serum. The serum therapy of cholera, if it is to meet with any success, must rest on an antitoxic basis, bearing in mind the clinical features of the disease. This also has generally been recognised by those who have endeavoured to introduce specific methods of treatment.

Numerous efforts have been made to obtain toxins from cultures of the cholera organism. Two theories, apparently contradictory, arose with regard to the nature of the specific toxins and gave rise to much controversy. It has been maintained, notably by French observers, that the poison is a genuine secretory product, both *in vita* and *in vitro*, and extracellular in the sense of being diffusible and soluble. Others, and pre-eminently German observers, maintain that the poison is inherent to the cell plasma and therefore of the intracellular type. The point of view determined in each case the method of investigation employed. The upholders of an extracellular poison endeavoured to obtain a secreted toxin by the cultivation of the bacillus on fluid laboratory soils, whilst those who held the poison to be intracellular worked with the killed and undoubtedly toxic bodies of the bacilli. It may be useful to summarise the main results that were obtained inasmuch as a good deal of the work dates ten years back.

Among the earlier observers Petri[1] grew the comma bacillus on peptone soils and obtained a heat-resistant proteid termed by him "toxo-peptone." The entire cultures, sterilised by heat, proved to be more toxic than their filtrates. Hueppe and Scholl[2] cultivated the bacilli in fresh sterile eggs. The alcoholic precipitate from the egg yielded an aqueous extract poisonous to the guinea-pig. This effect was, however, shown to be due mainly to ordinary decomposition products and the retained alcohol. Gamaleia,[3] as the result of his investigations, came to the conclusion that there are several cholera toxins. The organisms grown on a special veal broth yielded two soluble poisons—the one, thermolabile, produced diarrhœa in the rabbit, and the other, thermostable, caused an intoxication but without diarrhœa. The doses required to bring about these effects were considerable. Behring and Ransom in 1895[4] described a soluble poison obtained by them from fluid cultures of the comma bacillus which was heat-resistant and acutely toxic to the guinea-pig in concentrated doses. For this poison they were able to prepare an antitoxin. It can hardly be supposed that these observers were dealing so much with the genuine poison as with secondary products which are to be met with in old cultures of the cholera and other organisms. Nor does their serum appear to have exhibited antitoxic properties much more striking than those of the normal serum. The important researches of Metchnikoff, Roux, and Salimbeni[5] call for detailed notice, both on account of the ingenious methods employed and the results obtained. Highly virulent cultures of the comma bacillus, prepared by cultivation in collodion sacs in the peritoneal cavity of the guinea-pig, were sown on a special medium containing 2 per cent. peptone, 2 per cent. gelatin, and 1 per cent. sodic chloride. A short period of incubation was given to the cultures in order to obtain the toxin before it had undergone modification. The cultures reached their maximum toxicity on the fourth day and were then filtered. The filtrate was toxic on subcutaneous injection in doses of 0·3 cubic centimetre per 100 grammes weight of guinea-pig. This toxin, similarly to Behring and Ransom's, was not sensibly modified at boiling point but lost its activity under the action of air and light. The guinea-pig was most susceptible to the toxin, other animals, such as the rabbit, requiring larger doses. The poison acted subcutaneously and peritoneally. The effects consisted in hypothermia, peritonitis, fluid distension of the small intestine, along with hyperæmia of the abdominal organs. These results appear simple and conclusive in favour of the toxin obtained being a genuine secretion product of the bacilli. They are, however, open to another interpretation—viz., that these observers were really dealing with toxic elements of the comma bacillus which had been released by autolysis and disintegration of the cells. The death-rate of organisms, even in a young cholera culture, is rapid. Gottschlich and Weigang[6] found that in a two-days' culture of cholera at 37° C. only about 10 per cent. of the bacilli were alive and on the third day at most 1 per cent. It still remains to me doubtful if such poisons are of the same character as those developed in the body in the course of a cholera infection.

Pfeiffer is the most distinguished upholder of the doctrine that the cholera poison is contained in the protoplasm of the cell. Young broth cultures have no marked toxic effect on filtration. On the other hand, carefully killed young agar cultures produce an acute intoxication of the same nature as that produced by living cultures. This has been demonstrated by Pfeiffer, in a most careful series of experiments.[7] There can be little doubt that the primary cholera toxin is of the endocellular type, of an unstable character, and is easily converted into less toxic modifications. Its demonstration, therefore, requires a careful and conservative technique. Subsequent research has not substantially modified the respective standpoints indicated except in so far as Pfeiffer's conclusions have met with the widest acceptance. Since 1896 neither Behring and Ransom nor

[1] Petri: Arbeiten aus dem Kaiserlichen Gesundheitsamte, Band vi., 1890.
[2] Hueppe: Deutsche Medicinische Wochenschrift, p. 417, 1891.
[3] Gamaleia: Archives de Médecine Expérimentale, p. 172, 1892.
[4] Behring: Deutsche Medicinische Wochenschrift, p. 294, 1898; Ransom: ibid., p. 457, 1896.
[5] Metchnikoff, Roux, and Salimbeni: Annales de l'Institut Pasteur, vol. x., p. 257, 1896.
[6] Gottschlich and Weigang: Zeitschrift für Hygiene, p. 376, vol. xx., 1895.
[7] Pfeiffer, ibid., vol. xi., 1892, p. 393; vol. xv., 1894, p. 268; and vol. xx., 1895, p. 217.

Metchnikoff and his colleagues have, so far as I am aware, published any further communications and one may assume that the results did not fulfil their expectations. The reader must be referred to the papers by Kraus and Prautschoff[8] upon cholera and other vibrios and their hæmotoxins, toxins, and antitoxins, as the details do not admit of a short analysis.

Whilst the various methods employed have led to the demonstration of toxic elements in fluid cholera cultures the filtrates obtained are less toxic than the unfiltered cultures and have not given satisfactory immunising results. The criterion of an active toxin is the production of a potent antitoxic serum. Judged by this standard the soluble toxins hitherto described have proved disappointing. This will be evident by reference to the immunising experiments of Metchnikoff and his co-workers. Two horses received subcutaneous injections of the filtered toxin prepared in the manner described, the initial dose being ten cubic centimetres. At the end of six months the horses were able to tolerate injections of 200 cubic centimetres. The injections were made at intervals of from 10 to 12 days and caused considerable local reaction. The serum mixed with the filtered toxin and injected into guinea-pigs subcutaneously gave the following results. After three months' treatment, and a total injection of 350 cubic centimetres of toxin, three cubic centimetres of the horse's serum neutralised one and a half lethal doses of the filtered toxin. After six months, and the injection of 950 cubic centimetres of toxin, one cubic centimetre of serum neutralised four lethal doses of toxin. The figures indicate that the immunising value of the toxin and the antitoxin was of a feeble character. The Behring-Ransom serum was likewise found to neutralise the same toxin. The serums prepared in goats by Pfeiffer by the injection of the bodies of the bacilli were of high bacteriolytic power but without demonstrable antitoxic action for the intracellular poison. The serum did not protect against the killed and toxic bodies of the bacilli. Whilst, therefore, it is recognised that a cholera serum should possess antitoxic qualities, Pfeiffer's serum did not exhibit these and Metchnikoff's, even after a prolonged period of immunisation, did not in its effects strikingly exceed the range of action of normal serum. Further, the feasibility of preparing an antitoxin for that primary poison which exists as an integral constituent of the cholera bacillus has remained a matter of dispute, and has been regarded as impracticable by many competent bacteriologists.

It was with the object of obtaining a definitive result, either in a positive or negative sense, that the following investigation was undertaken. As I have already briefly stated in a previous paper upon an antitoxic typhoid serum the experiments with the cholera endotoxin were successful.[9] The cold-grinding method adopted gave the necessary conditions for obtaining the cholera endotoxin directly from the living cell and studying its properties. Virulent cultures of the comma bacillus were employed for the purpose of the experiments. The organisms were cultivated on nutrient agar in Roux bottles. A watery emulsion of the eighteen hours' growth was made, which was then washed in a high-speed centrifuge. The separated organisms were triturated at the temperature of liquid air and the product was taken up in 1 in 1000 caustic potash. On spinning, a clear supernatant fluid representing a 10 per cent. extract of the comma bacilli was obtained and was treated very rapidly with chloroform vapour. The cell juices were in every instance sterile and were acutely toxic to experimental animals. The quantitative yield from the various grinds was remarkably constant and averaged about ten milligrammes of solid matter per cubic centimetre of the juices. This being the case it was possible to trace any parallelism that might exist between the virulence and the toxicity of the cultures—a matter of considerable theoretical and practical importance. It may be here stated that the cultures of high virulence yielded the most toxic and the cultures of low virulence the least toxic juices, whilst in those instances in which the virulence had been allowed to diminish to such an extent that, e.g., two platinum loops of a culture did not kill the guinea-pig, the toxicity of the juice suffered a corresponding drop, one-half cubic centimetre and even one cubic centimetre failing to kill, whilst one-tenth cubic centimetre from a virulent culture killed acutely. This leads me to conclude that as regards the cholera endotoxin virulence and toxicity are intimately related, inasmuch as increased virulence implies increased toxicity and *vice versâ*. This observation may explain the discrepant results obtained by different workers and in any case justifies the use I have constantly made of virulent cultures in my investigations upon this and other pathogenic organisms.

The variations in toxicity of the cholera cell juices I consider to have been largely dependent on variations in the toxic quality of the material at the time of grinding. The index for a good yield of endotoxin is the virulence of the given culture and this varies under laboratory conditions despite all precautions taken, and is liable to sudden drops. It is a source of trouble in connexion with experimental work on the cholera organism.

Toxicity of the cell juices.—From the most virulent cultures toxic extracts were obtained which on peritoneal injection killed guinea-pigs acutely in doses of $\frac{1}{10}$th and $\frac{1}{20}$th cubic centimetre, whilst $\frac{1}{40}$th cubic centimetre rendered the animals ill. The average lethal dose for guinea-pigs of 300 grammes weight was $\frac{1}{10}$th cubic centimetre (about one milligramme). The extracts from cultures of lower virulence killed in doses of 0·3 and 0·5 cubic centimetre. Where the virulence was feeble doses of 0·5 cubic centimetre and upwards were necessary to kill the animals. The endotoxin also acted subcutaneously. The effects were the same as on peritoneal injection—congestion of the intestine, hyperæmia of the organs, and hæmorrhages in the stomach. The doses killing subcutaneously were two cubic centimetres and one cubic centimetre. In the instances tested 0·5 and 0·2 cubic centimetre failed to kill. The results were not so constant as those obtained with the smaller peritoneal doses.

The endotoxin likewise killed rabbits acutely on intravenous injection. The symptoms were collapse, occurring about three-quarters of an hour after the injection, acute diarrhœa, and a rapid fall of temperature ending in death, at times within one hour. From the most virulent cultures $\frac{1}{10}$th and $\frac{1}{20}$th cubic centimetre of the cell juices killed acutely with the above symptoms. The average lethal dose ranged from 0·3 to 0·5 cubic centimetre. The filtered juices were also toxic—e.g., 0·2 and 0·5 cubic centimetre of a filtered juice proved acutely fatal. The rabbit was more tolerant to subcutaneous injections—e.g., one, two, and three cubic centimetres of the endotoxin did not kill but produced considerable local swelling and induration. The guinea-pig proved more uniformly susceptible and was therefore mainly employed in the subsequent serum tests.

The endotoxin was acutely fatal to goats on intravenous injection. A goat died within 12 hours after an injection of $\frac{1}{10}$th cubic centimetre (about one milligramme). A second goat developed persistent diarrhœa after a dose of $\frac{1}{10\,0}$th cubic centimetre (about $\frac{1}{10}$th milligramme). In three other instances $\frac{1}{10\,0}$th cubic centimetre rendered the animals ill, whilst $\frac{1}{20}$th and $\frac{1}{40}$th cubic centimetre produced acute diarrhœa and death. These examples indicate the potent nature of the cholera endotoxin when introduced into the blood stream of a susceptible animal, $\frac{1}{10}$th milligramme of the material inducing marked toxic effects.

In all the above experiments the freshly prepared endotoxin was injected. The juices deteriorate in toxic power on keeping and are readily modified by heat, as will be seen from the following experiment:—

Toxic Cholera Cell Juice.

Half hour at 55° C.	Half hour at 60° C.	Unheated.
Guinea-pig: 1·0 c.c. alive.	Guinea-pig: 1·0 c.c. alive.	Guinea-pig: 1·0 c.c. dead.
Guinea-pig: 0·5 c.c. alive.	Guinea-pig: 0·5 c.c. alive.	Guinea-pig: 0·5 c.c. dead.
Guinea-pig: 0·3 c.c. alive.	Guinea-pig: 0·3 c.c. alive.	Guinea-pig: 0·3 c.c. dead.

The toxicity of the cell juices in the above doses was destroyed after half an hour's heating to 55° and 60° C. The results were the same in the case of the typhoid endotoxin obtained under similar conditions. The soluble toxins obtained by Ransom and by Metchnikoff resisted heating to 100° C.

Immunising experiments.—These were carried out on the rabbit and the goat. Normal rabbit's and goat's serum had no appreciable neutralising effect on the toxins obtained

[8] Kraus and Prautschoff: Centralblatt für Bacteriologie, Abtheil I., Hefte 3 and 4, 1906.

[9] Macfadyen: Proceedings of the Royal Society, March 8th, 1906; Brit. Med. Jour., April 21st, 1906.

directly from the cholera organism—one cubic centimetre of normal serum did not neutralise two lethal doses of the endotoxin. The rabbits received subcutaneous injections of the toxic cell juices and proved tolerant to considerable doses. One rabbit received at intervals of a week 1, 2, 3, and 5 cubic centimetres of the toxin subcutaneously. The serum was tested seven days after the last injection. The serum-toxin mixture was kept at 37° C. for half an hour before injection into the guinea-pig. The results are given in the following table:—

Guinea-pig.	Dose.	Result.
1	2 c.c. toxin + 2 c.c. serum	Alive
2	2 c.c. „ + 1 c.c. „	„
3	2 c.c. „ + ½ c.c. „	„
4	1 c.c. „ + 2 c.c. „	„
5	1 c.c. „ + 1 c.c. „	„
6	1 c.c. „ + ½ c.c. „	„
7	1 c.c. „ + 2 c.c. normal serum	Dead
8	0·2 toxin	„

One cubic centimetre of the toxic cell juice contained five ascertained lethal doses. The treated rabbit's serum had therefore acquired distinct anti-endotoxic properties, inasmuch as 0·5 cubic centimetre neutralised ten lethal doses of the endotoxin, whilst one cubic centimetre of normal serum did not neutralise two lethal doses. Other treated rabbits gave similar results after a short period of immunisation—e.g., in two instances tested, $\frac{1}{10}$th cubic centimetre of the serum protected against three and $\frac{1}{20}$th cubic centimetre against two ascertained lethal doses of the endotoxin. The injection of the fresh toxin in a condition favouring absorption no doubt favoured the result. By means of these experiments one was able to demonstrate at the outset the production of an antibody for the cholera endotoxin. It was also evident that one was dealing with an active toxin.

The further immunising experiments were carried out on the goat and the intravenous method of injection was employed. This animal is highly susceptible to the action of the cholera endotoxin, as will be seen from the figures already given, and a careful method of dosage is necessary for successful immunisation. A goat received intravenously at intervals of a week $\frac{1}{100}$th, $\frac{1}{50}$th, $\frac{1}{10}$th, $\frac{1}{5}$th, $\frac{1}{10}$th, and $\frac{1}{5}$th cubic centimetre of toxic cell juices. The animal was ill after the first injection and the subsequent doses produced distinct reactions. The serum was tested after the sixth injection. The results are given in the accompanying table:—

Guinea-pig.	Dose.	Result.
1	2 c.c. toxin + 2 c.c. serum.	Alive.
2	2 c.c. „ + 1 c.c. „	Dead.
3	2 c.c. „ + ½ c.c. „	Alive.
4	1 c.c. „ + 2 c.c. „	„
5	1 c.c. „ + 1 c.c. „	„
6	1 c.c. „ + ½ c.c. „	„

The cell juice contained four ascertained lethal doses in one cubic centimetre. The figures therefore show that one-half cubic centimetre of the serum protected against eight lethal doses of the endotoxin. It had been previously ascertained that one cubic centimetre normal goat's serum will not protect against two lethal doses of the poison, nor, as a matter of fact, was there any appreciable action in two cubic centimetres of normal serum.

A second goat was treated more deliberately and for a longer period, beginning with sublethal initial doses of the endotoxin, and tolerance was established to otherwise fatal amounts. The weekly injections made were $\frac{1}{100}$th, $\frac{1}{100}$th, $\frac{1}{50}$th, $\frac{1}{10}$th, $\frac{1}{50}$th, $\frac{1}{10}$th, $\frac{1}{10}$th, $\frac{1}{5}$th, $\frac{1}{10}$th, $\frac{1}{5}$th, $\frac{1}{5}$th, $\frac{1}{5}$th, $\frac{1}{2}$th, and ½rd cubic centimetre. The animal was ill after the first injections of $\frac{1}{100}$th, $\frac{1}{50}$th, $\frac{1}{10}$th, and $\frac{1}{5}$th cubic centimetre. The total amount injected was about one cubic centimetre, or 10 milligrammes, of solid matter. The injections extended over four months, the animal at the end of that time being alive and well. In the case of this goat the neutralising power of its serum was always tested against the same amount of toxic cell juice—viz., one cubic centimetre, and containing from three to five ascertained lethal doses. The serum-toxin mixture was kept at 37° C. for half an hour before injection into the guinea-pig. The following table represents the results obtained.

Serum Tests.

Goat.	Blood sample.	Ascertained lethal doses of toxin.	Amount of serum.	Guinea-pig. Result.
After 6 injections.		3	$\frac{1}{10}$ c.c.	Alive.
„	„ „	3	$\frac{1}{20}$ c.c.	„
„	„ „	3	$\frac{1}{50}$ c.c.	„
„	13 „	5	$\frac{1}{10}$ c.c.	„
„	„ „	5	$\frac{1}{20}$ c.c.	„
„	14 „	3	$\frac{1}{10}$ c.c.	„
„	„ „	3	$\frac{1}{20}$ c.c.	„
„	„ „	3	$\frac{1}{50}$ c.c.	„
„	„ „	3	$\frac{1}{100}$ c.c.	„
„	„ „	3	$\frac{1}{200}$ c.c.	„
„	„ „	3	$\frac{1}{500}$ c.c.	„
„	15 „	3	$\frac{1}{100}$ c.c.	„
„	„ „	3	$\frac{1}{200}$ c.c.	„
„	„ „	3	$\frac{1}{500}$ c.c.	„
„	„ „	3	$\frac{1}{1000}$ c.c.	„
„	„ „	3	$\frac{1}{2000}$ c.c.	„
„	„ „	3	$\frac{1}{5000}$ c.c.	„

The figures demonstrate that marked anti-endotoxic properties had developed in the serum of the goat and had increased to the degree that $\frac{1}{2000}$th cubic centimetre of the serum neutralised three ascertained lethal doses of the endotoxin, a property not possessed by one cubic centimetre of normal serum. A few tests were made with the goat's serum on the rabbit and showed that the serum likewise acted on intravenous injection. For example, $\frac{1}{10}$th cubic centimetre of the serum protected a rabbit against the intravenous injection of from three to four lethal doses of the endotoxin, and in other tests similar results were obtained.

The experiments having served their purpose have not in the meanwhile been carried further, although I have little doubt that still higher serum titrates could have been obtained. They demonstrate not only the feasibility of producing an antibody for the cholera endotoxin by the method adopted, but also the practicability of raising to a marked degree the anti-endotoxic value of the serum. It remains to add that the goat's serum likewise possessed agglutinative and bacteriolytic properties—e.g., $\frac{1}{1000}$th cubic centimetre of the serum agglutinated the cholera bacilli and $\frac{1}{1000}$th cubic centimetre gave Pfeiffer's reaction. The experiments in this direction were not carried further than was necessary to demonstrate the existence of these bodies.

CONCLUSIONS.

The experiments show:—1. That acutely toxic cell juices possessing active immunising properties can be obtained from the cholera organism by the method employed. 2. That an antibody can be produced for that primary poison which exists as an integral constituent of the cholera bacillus—a matter upon which there have been considerable dispute and difference of opinion. 3. That the anti-endotoxic power of the serum can be raised to a marked degree—a matter of equal importance. 4. That the serum in addition to its anti-endotoxic possessed agglutinative and bacteriolytic properties. 5. That in the case of the cholera organism there exists an intimate relationship between its virulence and toxicity. 6. That the cholera endotoxin obtained under the conditions described is thermolabile, being readily destroyed at 55° and 60° C.

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DIPHTHERIA IN TIVERTON RURAL DISTRICT.—At a meeting of the Tiverton (Devon) rural district council held on August 14th it was decided, on the recommendation of the Bradninch parochial committee, to request the Local Government Board to hold an inquiry into the causes of the outbreak of diphtheria which had existed for more than a year at Bradninch.

HÆMATOGENOUS ALBUMINURIA.*

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History.—Nearly 50 years passed after the connexion between albuminous urine, dropsy, and kidney disease was established by Dr. Bright in 1827, before the fact was recognised that albuminuria was found in a class of persons who were not the subjects of kidney disorder, at any rate in its usual forms. It was long before the chemical examination of the urine was made a matter of routine practice even in hospitals. This became more common during the third quarter of the nineteenth century but it was not until the ninth decade that it was considered a needful part of the examination of candidates by most insurance offices. Such keen clinicians as Gull[1] and Andrew Clark[2] in this country, Vogel[3] in Germany, and Jaccoud[4] in France, did not fail to observe these anomalous cases of albuminuria at an earlier date, but so far as appears the first clear account of them was given in Moxon's paper[5] in Guy's Hospital Reports for 1878. Dukes's observations[6] at Rugby quickly followed and many of us can remember how keenly the matter was discussed by Saundby,[7] Maguire,[8] Barnes,[9] and others during succeeding years. Pavy[10] defined the cyclic type in 1885, and the more favourable view of such cases which was finding acceptance was strongly contested by George Johnson.[11] Meanwhile Fürbringer[12] and Leube[13] in Germany, Capitan[12] in France, and Stirling[14] and Grainger Stewart[15] in this country, making observations on soldiers, cadets, children, and others, showed that a large percentage of persons accounted healthy by every other test passed albuminous urine at some time in the day. Munn[16] made similar observations on American candidates for life assurance.

It has thus come to be established that there is a form of albuminuria of common occurrence the subjects of which are generally young men or boys, although there is no reason to think that the female sex is exempt; often they are pale, wanting in vigour, and dyspeptic, and are liable to faints or headaches; they have usually excitable hearts and the arterial tension varies much under slight influences. The urine is not of continuously low specific gravity; the albumin, which consists mainly of serum albumin, is often present only at intervals, following the rise from bed and entry on the work of the day, or succeeding a meal, or coming on after muscular exertion, cold bathing, or emotional strain. In other cases its presence is continuous but the amount varies. The urinary sediment contains no tube casts or renal cells, excepting that sometimes a very few small hyaline casts may be found; crystals of oxalate of lime are often present; still more frequently there is an excess of uric acid. The albumin is also found in healthy persons—that is, in those who act in all ways as such.

Nomenclature.—This form of albuminuria has been termed "transient" (Capitan,[12] 1883; Legendre[10]; Rohlfing[13]; Flensburg[19]; cf. Petit,[21] 1875); "intermittent" (Moxon,[5] 1878; Rooke[17]; Falkenheim,[12] 1884; Bertrand[12]; Broadbent[18]; Guyon[10]; Rabagliati[20]); "of adolescents" (Moxon,[5] 1878; Dukes,[6] 1878); "physiological" (Marcacci,[21] 1878; W. Roberts,[22] 1884; Leube,[13] 1887; Weinbaum[19]; Sollmann,[7] &c.); "of the (apparently) healthy" (Fürbringer,[12] 1879; Griswold[12]; van Noorden[10]; Stirling[14]; Washburn[19]); "latent" (G. Johnson,[11] 1879; cf. Gueneau de Mussy,[21] 1874; and Rey,[21] 1876); "dietetic" or "alimentary" (Stanley Rendall,[12] 1883; Grainger Stewart[15]); "cyclic" (Pavy,[10] 1885; Merley[12]; Canfield[12]; Klemperer[13]; Ostwald[10]; Heim[19]); "functional" (Ralfe,[23] 1886; Gairdner[24]; Brandreth Symonds[10]; Armstrong[25]); "paroxysmal" and "simple persistent" (Grainger Stewart,[15] 1888); "neurotic" or "emotional" (Pesez,[12] 1888; Rem Picci[19]); "postural" or "orthostatic" (Marie[26]; Teissier,[27] 1899; Stokvis[19]); "early" (Dukes,[6] 1891); "benign" (Renard,[21] 1869); and "spurious" (Pizzini,[19] 1897). The number and variety of these designations are in accord with our ignorance hitherto of the pathology of the disorder. Many of the terms describe prominent features of some of the cases, others like "functional" are little more than a cloak for want of knowledge.

Causes.—Much stress has naturally been laid on the influence of blood pressure, altered by exercise, posture, or emotion, as a cause of the condition; yet it must be granted that the same cause produces in other persons no such effect. Moreover, the signs of an unstable neuro-vascular mechanism (Pavy[10]) are quite absent in some instances. As early as the days of Prout it was suspected that a change in the albumins of the blood apart from kidney disorder might be the cause of some forms of albuminuria. This was the opinion of Jaccoud[4] and it formed the subject of a thesis by Rendall,[12] and many inconclusive experiments were made to establish the theory. Semmola[29] worked in the same field and Bamberger[30] of Vienna in 1881 described "hæmatogenic albuminuria." These views were, however, speculative and Stokvis[19] declared in 1901 that proof of their truth as an explanation of benign albuminuria was wholly wanting. Teissier[27] thought that the kidneys might be ill developed so as to be permeable to the albumin of the blood.

Sir A. E. Wright's researches.—Sir A. E. Wright's hæmatological studies[31] have produced strong grounds for the belief that this kind of albuminuria is due to a disorder of the blood, the outstanding feature of which is lessened coagulability (diminished viscidity). The evidence for this has been already detailed in THE LANCET and may be summarised as follows. 1. In four subjects of this form of albuminuria the coagulation time of the blood averaged one minute 50 seconds. It is well known that salts of calcium increase the coagulability by promoting the formation of fibrin. By the administration of calcium lactate to these four subjects the time was reduced to an average of one minute 20 seconds. The albumin had then disappeared from their urine. 2. In four cases of albuminuria with signs of disease of the kidneys or urinary passages the average coagulation time was one minute 30 seconds and it was reduced by the administration of calcium lactate to an average of 50 seconds. The albumin was unchanged or somewhat increased in amount. 3. The functional efficacy of the kidneys was demonstrated to be unimpaired in seven of the first class of cases by the determination of the "excretory quotient," which is a measure of the power of the kidney to elaborate out of the blood a concentrated saline solution. In the four cases of the other class it was found to be lowered greatly. 4. The subjects of the form of albuminuria in question have usually been undergoing rapid bodily growth, in which there is a demand for calcium, especially for bone formation, so that a deficiency of this substance in the system is likely to occur. 5. Experience has shown that a milk diet which is rich in calcium cures the albuminuria in many cases. 6. Wright ranges this symptom with a class of other "serous hæmorrhages" dependent on transudation of serum and associated with lessened coagulability of the blood; amongst these are urticaria, chilblains, and forms of headache, œdema, and weeping eczema. It is not the rule for these disorders to occur in the same subject, so that it seems that one person is vulnerable in his skin, another in his meninges, another in his kidneys; and thus far a kidney weakness may be postulated in those who have hæmatogenous albuminuria.

Further observations.—The control of the albumin by the use of calcium lactate is the chief clinical test. It has been confirmed by other observers, although no results have yet been published so far as I know. I have used the test in 16 cases of albuminuria indiscriminately. In seven the albumin disappeared or was reduced to a small trace after the taking of the lactate. These were, I believe, all instances of hæmatogenous albuminuria. In the remaining nine the albumin persisted; in most of these cases signs of kidney disease were present, but in two or three the albumin may have been hæmatogenous, needing a longer course of the calcium salt for its removal. I give brief notes of the cases.

CASES 1, 2, and 3.—In two boys, aged 11 and 16 years respectively, and one girl, aged 13 years, a pretty dense cloud of albumin was found on boiling the forenoon urine, and there was also marked excess of uric acid as shown by Simon's test.[31] The forenoon urine some days later, after two or three doses of the lactate, was free from albumin and the uric acid was also much diminished. One of the boys had a most unstable nervous system and was liable to epileptic attacks; his albumin varied from 1 per cent. (Esbach) to *nil* under changed conditions of diet and exercise.[13] I have watched this case during several months and am fully satisfied of the control of the albumin by the

* The superior figures occurring throughout the article are references to the bibliography at the end.

lactate which, however, has to be continued in bi-weekly doses to prevent recurrence.

CASES 4 and 5.—The patients were two men aged 25 and 39 years respectively, in whom a thin cloud of albumin disappeared after 30 grains of the lactate. In the latter case the effect was transient and the remedy had to be repeated.

CASE 6.—A neuralgic ailing woman, 32 years of age, passed albumin in her urine, a marked cloud on boiling. After three doses of the lactate it was reduced to a trace.

CASE 7.—A thin cloud in a hypochondriacal woman, aged 50 years, entirely passed away under the remedy.

CASES 8 and 9.—The patients were two men, aged about 42 and 50 years respectively, of full habit of body, and rather florid. They were known to have passed albumin for two and three years respectively; there were no renal elements in the centrifugalised sediment. The elder of the two took alcohol freely. The albumin was unchanged after two doses of the lactate, which was not further pursued.

CASE 10.—The patient, a man aged 35 years, had albuminuria (about 0·2 Esbach) for eight years following acute nephritis. The deposit showed a few small casts and blood discs and many fragments of uric acid crystals. Two doses of calcium lactate only diminished the quantity of albumin.

CASE 11.—A man, aged 49 years, had passed copious albumin for at least 18 years. Tube casts were numerous; the general health apparently was excellent, and the patient was stout and florid. Arterial tension was high but there was no other vascular change. After several doses of lactate the albumin was apparently increased in quantity. This is an instance of the rare condition of "albuminuria of long standing with apparent health."

CASE 12.—A man, aged 54 years, had had albuminuria for at least three years; many casts were present and the arteries were thickened. The albumin was unchanged after the lactate treatment.

CASE 13.—The patient was a woman, aged 55 years, who had had albuminuria on and off for eight years with cardio-vascular changes; the urinary sediment showed one or two casts and some renal cells. After two doses of the lactate the albumin was reduced from a thin cloud to a trace.

CASE 14.—The patient was a man, aged 58 years, who was very obese. Arterial tension was high. The albumin, which presented a dense cloud on boiling, was persistent after taking the lactate.

CASE 15.—The patient was a man, aged 69 years. He appeared worn and had thickened arteries. A dense cloud of albumin was present, with renal cells. There was no change after taking the lactate. This patient died five months later from cerebral hæmorrhage.

CASE 16.—The patient, a man, aged 75 years, in fair general health, but with a cordy pulse of high tension, was known to have had albuminuria for three years. Two or three casts were found in the sediment. There was no change after two doses of the lactate. This was a case of slow senile albuminuria.

The calcium-lactate test was applied as follows. Two doses were given, in some cases more; about 15 grains in each dose, varied according to age and body weight; the patient took one at bedtime and the second two nights later and supplied a sample of the urine passed about noon on the day succeeding the second dose. The evidence given fairly proves the existence of what I have termed "hæmatogenous albuminuria";[22] that is to say, that in many cases of albuminuria the primary cause is the state of the blood. It is probable that these cases include the bulk of those hitherto described as "adolescent," "cyclic," &c. The disturbance of the neuro-vascular mechanism so often found seems to be only a contributing cause. Further observations are needed to define the limits of the condition.

Diagnosis.—In most of the cases of hæmatogenous albuminuria the conditions already noted as to age, nervous temperament, and excitable circulation are present. Headaches or faints are common. But the three chief signs are: (1) the albumin is absent or at least lessened in the night urine; (2) it disappears after taking calcium lactate; and (3) the urinary sediment (centrifugalised or deposited after 24 hours' standing) contains no casts or renal cells, but often crystals of uric acid or oxalates. Hæmatogenous albuminuria must be distinguished from the rare condition of "albuminuria of long-standing without apparent disturbance of health" described by Dr. F. Hawkins,[23] by myself,[24] and by others, and of which Case 11 is an instance. Here the albumin is nephrogenous and possibly comes from a limited lesion of one kidney (Ziemssen); epithelial casts are shed freely, the albumin is persistent at all hours, and in Case 11 was quite uncontrolled by the calcium salt. The full diagnosis of hæmatogenous albuminuria cannot be made without a microscopic examination and the use of the calcium-lactate test, but its recognition at a first interview is often possible.

Prognosis.—Many years' experience is needful to decide with certainty whether these cases eventually become the subject of progressive kidney disease. S. West,[25] writing of "albuminuria in the apparently healthy," thinks it probable that many do so. Dukes,[6] who was inclined to the same view, has abandoned it, finding that many of his former juvenile patients are now robust men. The experience of Pavy[16] and Broadbent[18] has also been favourable. Teissier's record[27] of 28 cases under observation for ten years showed no deaths and only four ephemeral recurrences of the albumin. The opinions of some German observers are emphatic. Pribram[20] states that the cases always recover even after lasting several years and that albuminuria of puberty never develops into nephritis. I have recorded in a paper read recently before the Life Assurance Medical Officers' Association the sequels of 111 consecutive cases of albuminuria found in life examinations for certain insurance offices and institutions between 1884 and 1896; 19 were more or less of the cyclic type. The result of inquiries made in the present year after the lapse of a period varying from ten to 22 years is as follows. Of the 19 cyclic cases one patient has died from tuberculosis of lungs and larynx and one from accident, and the remaining 17 are living, most of them apparently in good health. The sequel of the 92 other cases of albuminuria (including 63 of traces only) is also not unfavourable; six patients are known to have died and eight have been lost sight of; 78 are living, mostly in good health. Mr. E. R. Bickersteth of Liverpool kindly allows me to state his experience. More than 20 years ago he examined a large number of youths, aged from 15 to 16 years, for entry as junior clerks into insurance offices and banks and found albumin in the urine of more than one-quarter of the number. He dieted them, allowing no butcher's meat, and the albumin totally ceased in almost all cases. He had the opportunity of watching several of these youths for many years afterwards and found that after full maturity and the completion of growth the liability to pass albumin ceased altogether.

So far, then, the evidence suggests that we need not take a serious view of this disorder. It is indeed pathological, as chilblains and urticaria are pathological, and the term "physiological albuminuria" is a misnomer. But the prognosis is mainly that of the state of blood-debility, of which it is only a symptom. For life-insurance purposes I advise that a small extra be usually imposed, but some cases, after the urine has become free from albumin, may be taken as first-class lives.

Treatment.—Clinical instinct has not been at fault in the treatment of these cases, albeit their pathology was unknown. Rest in bed, a milk diet, saline purgation, iron, and nux vomica—tonics for the blood and nervous system—these means were used long ago and they cured the disorder. Rest may, however, be overdone, for, as Armstrong[28] has well pointed out, the school boy is all the better for his fresh air and play, though he should not compete in races. The value of milk is probably due to the calcium which it contains; and the salines produce a watery osmosis which renders the blood more concentrated. Alcohol should not be given, for it is a "lymphagogue," and is suspected of producing the disorder. The direct use of calcium lactate gives us a new and effectual means of altering the blood state on which the transudation of albumin depends. It is needful in some cases to continue its use over a long period. Nias[29] has recently studied a case in which calcium salts were not absorbed, but those of strontium and magnesium were absorbed with facility, and had a coagulative effect. Possibly Cases 8 and 9 (above) were of this kind. It would be well to try a dose (15 to 30 grains) of strontium lactate when the albuminuria is refractory to the calcium salt.

Bibliography.—[1] Sir W. W. Gull, quoted by Moxon (see below); also in discussion before the Royal Medical and Chirurgical Society, 1873 (not verified). [2] Sir Andrew Clark: London Hospital Reports, vol. i., 1864, pp. 225, 227, 235. [3] Vogel, in Virchow's Handbuch, 1863, quoted by Jaccoud. [4] Jaccoud: Article Albuminurie, in Nouveau Dictionnaire de Médecine et de Chirurgie, Paris, 1864, tome i., pp. 526, 580. His words are: "Dans quelques cas exceptionnels ..... une albuminurie, quoique persistante, n'a pas d'autre signification pronostique qu'une albuminurie passagère. ..... La découverte de l'albuminurie a été purement fortuite, et sans cette circonstance, ces individus auraient

passé pour être en parfaite santé." C'est "une curiosité pathologique, encore inexpliquée." Elsewhere he speaks of "Albuminurie par altération du sang," without lesion of the kidneys. See also British and Foreign Medico-Chirurgical Review, April, 1868, p. 323. [7] Moxon: Guy's Hospital Reports, third series, xxiii., 1878, p. 233. Refer also to Clement Lucas, Transactions of the Hunterian Society, 1891-92, p. 104, for the supposed connexion with masturbation. [8] Dukes: Brit. Med. Jour., 1878, vol. ii., p. 784; 1881, vol. ii., p. 776; 1905, vol. ii., p. 848; THE LANCET, Dec. 12th, 1891, p. 1327. [9] Saundby: Brit. Med. Jour., 1879, vol. i., p. 699; 1880, vol. i., p. 841. [10] Maguire: THE LANCET, June 5th, 1886, p. 1062. [11] R. Barnes: THE LANCET, May 12th, 1888, pp. 914, &c.; and March 18th, 1893, p. 615. [12] Pavy: THE LANCET, Oct. 17th, 1885, p. 706; Brit. Med. Jour., 1889, vol. ii., p. 417; Transactions of the Hunterian Society, 1891-92, p. 101; Transactions of the Medical Society of London, vol. xxvii., p. 95. [13] Sir G. Johnson: Brit. Med. Jour., 1879, vol. ii., p. 928; 1889, vol. i., p. 225; &c. [14] References to these authors will be found under Albuminuria (Intermittent) in the Index Catalogue of the Library of the Surgeon-General of United States, second series, vol. i., pp. 212, ff. [15] Leube: Virchow's Archiv, Band lxxii., quoted in THE LANCET, April 6th, 1878, p. 503. [16] Stirling: THE LANCET, Dec. 10th, 1887, p. 1157. [17] Grainger Stewart: On Albuminuria. 1888; also Brit. Med. Jour., 1887, vol. i., p. 1264; 1888, vol. ii., p. 81. He describes the case of a girl, aged 13 years, whose albuminuria varied extremely with posture. &c., as in Case 1 recorded in the text. [18] Munn, quoted by Fagge, Medicine, third edition, vol. ii., p. 450. [19] Rooke: Brit. Med. Jour., 1873, vol. ii., p. 596. [20] Broadbent: Intermittent Albuminuria, in "The Pulse," 1890, p. 265. [21] Stokvis, a valuable article, Albuminurie, in the Rapports du Deuxième Congrès des Médecins Experts des Compagnies d'Assurance, Amsterdam, 1901, and references quoted by him. [22] Rabagliati, Brit. Med. Jour., 1889, vol. ii., p. 422; also a paper read before the Yorkshire Institute of Actuaries, 1906. [23] See Index Catalogue of the Library of the Surgeon-General of the United States, vol. i., Albuminuria. [24] Sir W. Roberts, 1884. See Index Catalogue, supra; also Transactions of the Hunterian Society, 1891-92, p. 103. [25] Ralfe: Brit. Med. Jour., 1886, vol. ii., p. 1012; THE LANCET, Oct. 23rd, 1886, p. 784, and Nov. 17th and 24th, 1888, pp. 983 and 1008 respectively. He states that Prout used the term "functional." [26] Sir W. Gairdner, Brit. Med. Jour., 1889, vol. ii., p. 422. [27] Armstrong: Transactions of the Medical Society of London, vol. xxvii., p. 86; Brit. Med. Jour., 1904, vol. ii., p. 905. [28] Marie, quoted by Armstrong, supra. [29] Teissier, Les Albuminuries Curables, 1900, quoted by Stokvis. Also at French Congress of Internal Medicine, quoted by De H. Hall, Transactions of the Medical Society of London, vol. xxvii., p. 89. Also Brit. Med. Jour., 1905, vol. ii., Epitome, p. 65. [30] Semmola, Paris, 1867; see Index Catalogue of the Surgeon-General of the United States, vol. i.; THE LANCET, Oct. 18th, 1879, p. 583; Brit Med. Jour., 1895, vol. i., Epitome, p. 32. [31] Bamberger, quoted in THE LANCET, March 19th, 1881, p. 468. [32] Sir A. E. Wright's researches on the coagulability of the blood and its influence in various disorders are described in a series of papers in THE LANCET in 1896, 1897, 1904, and especially (in conjunction with Dr. G. W. Ross) in the issue of Oct. 21st, 1905, p. 1164. Also in the Transactions of the Pathological Society of London, 1900, p. 298, and in the Transactions of the Royal Medical and Chirurgical Society, 1903, p. 1. [33] Simon: Manual of Clinical Diagnosis, fifth edition, p. 493. [34] Tirard, in Albuminuria and Bright's Disease, 1899, uses the term "hæmatogenous albuminuria" in a more restricted sense. [35] F. Hawkins: Transactions of the Clinical Society of London, vol. xxvi., p. 216; Transactions of the Life Assurance Medical Officers' Association, 1896, p. 24; 1898-99, pp. 148, 155. [36] Hingston Fox: Transactions of the Life Assurance Medical Officers' Association, 1906, p. 61; Transactions of the Hunterian Society, 1891-92, p. 94. [37] S. West: Transactions of the Medical Society of London, vol. xxvii., p. 86. [38] Pribram: quoted by Armstrong, supra. [39] Nias: THE LANCET, August 18th, 1906, p. 436.

Weymouth-street, W.

TWO CASES OF MULTIPLE INFECTION.

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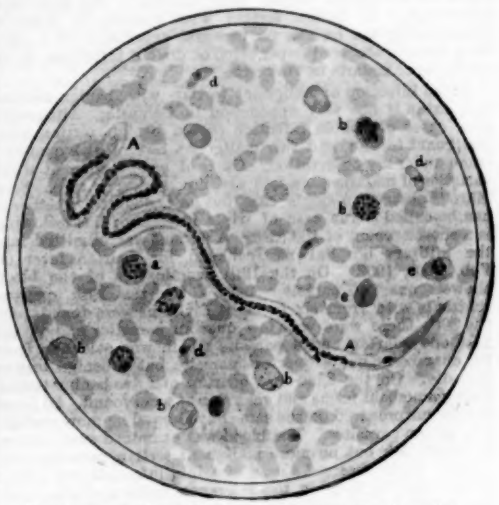
THE following is an account of two cases of multiple infection which came under my observation.

CASE 1.—The patient, a man, aged 40 years, was admitted into the Medical College Hospital, Calcutta, on Nov. 20th, 1903, for fever and jaundice. He gave a history that he had been suffering from the disease for a week. The fever was continuous and was ushered in with ague, but these symptoms ceased after admission. At the time of admission he was found to be markedly jaundiced. His intellect was dull. The pulse was slow (60 per minute). The spleen was just below the costal arch. The temperature was 102° F. on admission; it rose to 104° in the afternoon. There was no ague. Quinine was given hypodermically in the afternoon. On the next day the morning temperature was 101°. It rose to 102° in the afternoon and under repeated quinine injections the fever fluctuated between 100° and 102° for a week and then left.

Examination of the blood of the patient showed a remarkable appearance. In every field numerous malaria parasites of all shapes and sizes were found. The following is a description of these parasites. 1. Numerous crescents; from ten to 12 were present in each field. Some were still immature and intracorpuscular, others were fully developed, and some were of a spheroidal shape. 2. A great number of rings were found; they were mostly small rings with a single chromatic body. The ring was linear, the corpuscle showing a few coarse stipplings. There was no change in the corpuscles. A few free rings were also seen. 3. Half-developed parasites. There were a good many of these found. Most of them showed a big chromatic body surrounded by a body protoplasm dotted with rod-shaped pigments. The corpuscles were enlarged and showed Schüffner's dots. There were found also a few parasites in which the pigment particles were coarse. The corpuscles in which they were situated showed no change; no stippling, &c. The suspicion that they were quartan parasites was settled by the finding of a few typical quartan rosettes. 4. Fully developed parasites with rosettes. Fully developed benign tertian parasites with Schüffner's dots were the most common and prominent. A few benign tertian rosettes with from 16 to 18 divisions were also seen. Besides, as noted before, a few quartan band forming parasites and typical quartan rosettes were found. 5. While examining one of the slides stained with Leishman's stain for the above malaria parasites there was found in one field a beautifully stained filaria embryo. The sheath is distinctly seen in the figure (A).



From a preparation made from the blood of Case 1 on the first day in the daytime, stained with Leishman's stain. A, Filaria is seen with its sheath. *a*, Benign tertian, a fully developed one. *b*, Benign tertian rosette. *d*, Crescents. *c*, Quartan, early stage.

Examination of the blood at night showed a few living filaria embryoes in a hanging-drop specimen.

Blood examined on the next day (after the quinine injection) showed numerous crescents as before, very few rings, and a few half-developed benign tertian and quartan parasites; no rosettes were seen. On the third day examination showed a good many crescents, a few rings, and no benign tertian parasites. On the fourth day crescents were found in diminished numbers. No other parasites were found. On the eighth day a few crescents were found after a long examination.

CASE 2.—The patient, a Hindoo male, aged 20 years, had been suffering from fever for a month when he came under my notice on Nov. 28th, 1903. His temperature was at that time 103° F. He was markedly anæmic; no enlargement of the spleen was perceptible. Examination of the blood showed numerous malaria parasites. These on careful examination of a stained slide (Leishman stain) were found to belong to all the three varieties of malaria parasites, benign tertian, quartan, and malignant tertian. Numerous rings were found. A good number of crescents were seen mixed with bright-coloured benign tertian parasites. A few quartan and benign tertian rosettes were seen. As I lost sight of the case no further examination of the blood of the patient was made.

The above cases are noteworthy on several grounds. Cases of true double infection by animal parasites are no doubt

common. These are found mostly in connexion with malaria. Golgi[1] was the first to observe a case of double infection in a Sardinian who was suffering from daily fever of different intensity. He found quartan parasites and afterwards malignant tertian parasites. Canalis[2] observed infection of benign tertian with quartan or with malignant tertian. Romaniskwy[3] observed combination of quartan with malignant tertian in three cases. Di Mattei[4] injected a tropical parasite infected patient with quartan parasites from another patient and found the tropical parasites with quartan. Vincenzi[5] observed two cases of malignant tertian with quartan. Thayer and Hewetson[6] found out of 542 malaria-infected cases 11 mixed cases, specially malignant tertian with benign tertian. Koch[7] found out of 72 cases of malaria two mixed cases (malignant tertian and quartan). Mannaberg[8] saw two cases in which the blood showed malignant tertian and benign tertian parasites. Ruge[9] described some cases of benign tertian and malignant tertian with charts. He observes that both parasites cannot remain for a long time beside one another. The small rings crowd out the large rings, and Mattei has shown by inoculation experiments that either this happens or that the big parasites crowd out of the field the malignant tertian parasites. He also observed cases of malignant tertian with quartan. He says that combination of benign tertian with quartan is possible theoretically but he has no personal experience of a case. Serg Marc[10] observed 3 per cent. of double infections in an epidemic of malaria in Turkestan.

Mixed infection of malignant tertian with benign tertian or quartan is not very uncommon in Calcutta. Altogether nine cases of double infection (seven benign tertian with malignant tertian, and two malignant tertian with quartan) came under my observation. Cases of combination of three varieties of malaria parasites are, however, very rare. Serg Marc[11] observed a single case but he is doubtful whether it can be called a true case of triple infection; the following is a short account of the case. A patient was admitted into the military hospital at Tashkend for quartan fever on Feb. 17th, 1902. On the 18th examination of the blood showed quartan parasites only. On the 19th quartan schizonts with from six to eight divisions were found. On the 20th there were very few quartan parasites and on the 21st one quartan and a parasite which was evidently from its characters not a quartan parasite but a benign tertian parasite. On the 22nd two quartan and five benign tertian young amœboid forms and *one crescent* were found. 30 blood specimens prepared on the same day showed no more malignant tertian parasites. The blood was examined every day up to March 9th but no more malignant tertian parasites were found. Celli observed a case of triple infection but details of it cannot be found in the reference books available here; nor could I find reference to any other case of true triple infection.

Combination of three varieties of malaria parasites with filaria as observed by me in Case 1 must be very rare; and I could not find reference to a single case of a similar nature. Double infection of a single variety of malaria parasite with filaria has no doubt been observed. Selous[12] reported a case of benign tertian with filaria. Last year a case of fever was admitted in one of the hospitals in Calcutta, which was treated as a case of filariasis on account of the presence of filaria in the blood, though the blood of the patient was crammed with crescents, which were detected accidentally in examining for the filaria.

In conclusion I beg to thank Lieutenant-Colonel G. F. A. Harris, I.M.S., visiting physician, Calcutta Medical College Hospital, for kindly allowing me to publish Case 1.

Calcutta.

[1] Golgi: Sul Ciclo Evolutivo dei Parasiti Malarici nella Febbre Terzana, Archivo delle Scienze Medichi, 1893, vol. xiii.
[2] P. Canalis: Studie sulla Infezione Malarina, ebenda, 1890, vol. xiv.
[3] Romaniskwy: Zur Diagnose der Irregularen in dem Malaria-Fieber, Wratsch, 1892.
[4] Di Mattei Ebenda, 1895, vol. xix.
[5] Vincenzi: Ebenda, 1895, vol. xix.
[6] Thayer and Hewetson: The Malarial Fevers of Baltimore, John Hopkins Hospital Reports, 1896, vol. v.
[7] R. Koch: Reiseberichte, Berlin, 1898.
[8] Mannaberg: Die Malaria-Krankheiten, 1899.
[9] Ruge: Handbuch der Pathogenen Mikro-organismen.
[10] Serg Marc: Die Malaria in Turkestan, Zeitschrift für Hygiene, Band xiv.
[11] Ibid.
[12] C. F. Selous: THE LANCET, Nov. 5th, 1904, p. 1284.

ON THE CORRECTION OF DEATH-RATES.

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FOR some time past I have had doubts as to the sufficiency of the Registrar-General's method for working out the so-called "corrected" death-rate for a town or district. This "corrected" death-rate may be approximately correct when the numbers at the several age periods are approximately equal and have nearly equal death-rates, but I shall endeavour to show that the usual method will not produce a correct result when there is a great difference in the numbers at the several age periods and at the same time there are widely different rates of mortality. I take for my example the city of Calcutta, the population of which is shown in the following table (Table A.):—

TABLE A.—*Mortality of Calcutta, 1904.*

Ages (years).	Population of Calcutta, census 1901.		Total.	Deaths, 1904.		Total.	Recorded death-rates.		Total.
	Males.	Females.		Males.	Females.		Males.	Females.	
Under 5 ...	31,494	28,861	60,355	3,501	3,143	6,644	111·1	108·9	110·0
5 to 10 ...	31,717	28,406	60,123	638	635	1,271	20·0	22·3	21·1
10 to 20 ...	92,562	50,878	143,440	1,578	1,062	2,644	17·0	20·9	18·4
20 to 40 ...	271,852	100,129	371,981	5,008	2,540	7,548	18·4	25·3	20·2
40 to 60 ...	112,099	57,186	169,285	2,902	1,545	4,447	25·8	27·0	26·2
60 and upwards ...	22,872	19,740	42,612	2,233	2,536	4,769	97·6	128·4	111·9
Totals ...	562,596	285,200	847,796	15,858	11,465	27,323	28·1	40·1	32·2

As a standard I take Bengal with a population of over 70,000,000, a miniature of which is shown in the next table (Table B).

TABLE B.—*A Miniature Bengal Population (847,796) at Bengal Rates.*

Ages (years).	Males.		Females.	
Under 5	55,955 @ 101·7	= 5694	60,194 @ 87·6	= 5273
5 to 10	64,432 @ 18·65	= 1201	62,737 @ 15·85	= 994
10 to 15	52,563 @ 13·96	= 733	42,390 @ 12·77	= 541
15 to 20	36,455 @ 16·74	= 610	38,151 @ 17·73	= 676
20 to 30	70,367 @ 18·38	= 1293	75,454 @ 19·01	= 1434
30 to 40	60,194 @ 20·67	= 1244	55,955 @ 19·46	= 1089
40 to 50	41,542 @ 26·05	= 1082	38,999 @ 24·18	= 943
50 to 60	23,738 @ 38·84	= 922	24,586 @ 35·33	= 868
60 and upwards ...	19,499 @ 76·14	= 1484	24,586 @ 61·72	= 1517
Totals	424,745	14,263	423,052	13,340

Male rate = 33·5. Female rate = 31·5. General rate = 32·5.

Calcutta in 1904 had a recorded death-rate of 32·2 while Bengal had a rate of 32·45. The "standard" death-rate for Calcutta is 28·6 (see Table C below) and the death-rate corrected by the usual method is 36·6.

My proposal is that a miniature population of the standard should be taken (equal in total to that of the city under correction) and that to the numbers of this miniature standard at the several age periods and in the two sexes the death-rates of the city under correction should be applied. By this method we obtain a hypothetical number of deaths

TABLE C.—*Calcutta, 1904 (Mortality at Bengal Rates).*

Ages (years).	Males.		Females.	
Under 5	31,494 @ 101·7 =	3203	28,881 @ 87·5 =	2526
5 to 10	31,717 @ 18·65 =	591	28,406 @ 15·85 =	450
10 to 15	40,398 @ 13·96 =	566	24,304 @ 12·77 =	310
15 to 20	51,964 @ 16·74 =	870	26,574 @ 17·73 =	471
20 to 30	151,637 @ 18·38 =	2787	54,770 @ 19·01 =	1041
30 to 40	120,215 @ 20·67 =	2485	45,359 @ 19·46 =	882
40 to 50	74,523 @ 26·05 =	1941	34,797 @ 24·18 =	841
50 to 60	37,576 @ 38·64 =	1459	22,389 @ 35·33 =	791
60 and upwards ...	22,872 @ 76·14 =	1740	19,740 @ 61·72 =	1218
Totals	562,596	15,642	285,200	8530

Male rate = 27·9. Female rate = 29·8. 24,172 deaths on population of 847,796 = rate of 28·6 per 1000.

which gives a rate (in case of Calcutta) higher than is obtained by the conventional process but which, I contend, represents the true death-rate of a city. (See Table D, below).

TABLE D.—*Miniature Bengal Population (Calcutta) at Calcutta Rates.*

Ages (years).	Males.		Females.	
Under 5	55,965	@ 111·1 = 6,216	66,194	@ 108·9 = 6,555
5 to 10	64,432	@ 20·0 = 1,288	62,737	@ 22·3 = 1,399
10 to 15	52,563	@ 17·0 = 1,513	42,390	@ 20·9 = 1,683
15 to 20	36,455		38,151	
20 to 30	70,367	@ 18·4 = 2,402	75,454	@ 25·3 = 3,324
30 to 40	60,194		55,956	
40 to 50	41,542	@ 25·8 = 1,684	38,999	@ 27·0 = 1,716
50 to 60	23,738		24,586	
60 and upwards	19,499	@ 97·6 = 1,903	24,586	@ 128·4 = 3,156
Totals	424,745	15,006	423,052	17,833

Male rate, 35·3. Female rate, 42·1. Combined rate, 38·7 per 1000.

We may put these calculations in a graphic way. To obtain the standard rate for a city we, so to speak, transport the city population to conditions of life (liability to death) such as rule for the average of the whole country. By the suggested method we import the standard population into the city and place it under the conditions of life ruling in the city and we obtain thereby a rate which represents the effects of the particular city life on the standard population (Table D). It is contended that the Registrar-General's method does not give a correct result when worked on such an exceptional population as that of Calcutta in which not only are there twice the number of males as of females (and an enormous excess at certain age periods) but death-rates for males much lower at nearly all ages than those for females. The effect of the great excess of the male population at healthy ages in Calcutta is so marked that if the male population be equalised to the female at all ages the death-rate works out at 37·2 per 1000. Contrast even this correction with that usually adopted.

Bengal "standard" rate (rate for 1904) ... 32·45

Calcutta standard rate ... ... 28·6

$\frac{32{\cdot}45}{28{\cdot}51}$ 1·1381 (factor for 1904)

Calcutta crude death-rate ... 32·2 per 1000

32·2 × 1·1381 = 36·6 (corrected rate)

Comparative mortality figure (1904) ... $\frac{36{\cdot}6}{32{\cdot}45} \times 1000 = 1127$

To sum up; a miniature standard (Bengal) population (equal to Calcutta, viz., 847,796) with age and sex constitution as of Bengal at rates of mortality ruling in Calcutta gives a death-rate for the city of 38·7 per 1000 (see Table D), as compared with 36·6 by the usual method of correction.

Calcutta.

THE INDUCTION OF HYPNOSIS.

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THE correspondence arising from the account of my experiments published in THE LANCET a few months ago,[1] has shown me that there is a very widespread interest in the subject of hypnosis, an interest which is coupled with an extraordinary ignorance of the huge literature that deals with this condition and in some quarters expressed by a still more extraordinary scepticism as to the existence of such a mental state. The interest thus evidenced has prompted me to give some further account of my investigations during the last six months, and to show that the condition of hypnosis can be examined by anyone who takes the trouble to put himself in possession of the requisite technical knowledge and is prepared to devote time to a definite series of experiments. My own interest in the question arose some two or three years ago, and when after months of trial I had not succeeded in obtaining a condition in the least resembling hypnosis (but had caused a good deal of amusement among my friends), my position became that of the antagonistic sceptic rather than of the unprejudiced investigator. These early attempts were made on hysterical patients of a somewhat low order of intelligence and, as I now know, my methods were hopelessly crude. After a careful study of the hypnotic literature, a continuation of my experiments with healthy male subjects was rewarded by results which conclusively proved to my mind that the recorded experimental phenomena of hypnosis were genuine enough, and a description of some of these experiments formed the basis of the paper I have referred to.

It is curious that most of us should be more sceptical with regard to hypnotic experiments than to other investigations. Perhaps this is because the medical curriculum excludes all reference to the subject and because to the majority of practitioners the writings of such men as Liébeault, Bernheim, Charcot, Braid, Esdaile, Elliotson, Moll, Wetterstrand, Bramwell, Tuckey, van Eeden, and van Renterghem are absolutely unknown. An experience such as mine makes one somewhat ashamed to have ever doubted the evidence of the many workers in this field. As a matter of fact the general agreement as to phenomena observed, recorded in so many separate centres, is the most powerful argument that can be brought to bear on the individual who persists that the investigators of hypnosis have been deceived in their observations.

The popular conception of hypnosis is that of a condition in which the subject has been deprived of all freedom of mind by the "will" of the operator. Moreover, that this latter must be a person of extraordinary "will-power," with the special facility of overcoming "weaker wills" whenever he feels so inclined; the fact that his victim may be *hundreds of miles away* seems to be of little importance. This sort of pernicious rubbish is served out to the public by the day and by the week—a public that will absorb nonsense referring to "mind" or "will" even more readily than that referring to "backache" and "liver." On the other hand, those who take the trouble to examine the condition will find that success in producing hypnosis depends rather more on the wish of the subject than on the "will" of the operator—that is to say, in ordinary circumstances if a person does not want to be hypnotised you cannot influence him, hypnosis being a state in which by fixing the attention the mind tends to become a blank for the time being and is consequently peculiarly receptive to impressions from without, such as may be given by verbal suggestion. The thing is to get the subject to fix his attention and to inhibit the natural stream of thought; then it is as if you had a blank screen on which to project ideas or pictures. If the fixation of attention is great enough or the subject's natural powers of inhibition are strong enough a condition resembling sleep ensues. Thus there are two phases of hypnosis—one in which the fixation of attention is incomplete, so that the subject, although amenable to suggestion, is yet perfectly conscious of his surroundings; the other in which the inhibition of thought is so complete that he loses touch with

[1] THE LANCET, Jan. 27th, 1906, p. 216.

his surroundings and is to all intents and purposes asleep To say that one has inhibited the "supraliminal consciousness" or "objective mind" and unmasked the "subliminal consciousness" or "subjective mind" is really only another way of expressing the above process. It obviously requires no particular inherent property or power to help a person to fix his attention so as to stop his train of thought—a process which may be to great extent mechanical and consequently will require some adroitness of method. So that anybody who has tried various methods of bringing about this desired object and has studied the best means of distracting a subject's attention from his surroundings and "fixing it," and has carefully observed the conditions that predispose to success, will be more readily able to induce hypnosis than another who tried at hazard to use a method he has read about but of which he has no technical knowledge. It stands to reason that the conditions that will readily fix one person's attention will perhaps disturb another person to such an extent that he will think faster than ever, instead of lapsing into a state of mental calm.

Let it be clearly understood then that an expert hypnotist is not a person endowed with some mysterious power, but is somebody who has taken the trouble to study carefully the psychology of his subjects, with the object of ascertaining what means are likely to succeed best in bringing about in them a state of mental rest, suiting his methods to every individual case. Psychologists define "Attention" as mental activity which raises certain sensations or ideas in point of intensity and completeness, with a corresponding lowering of simultaneously presented impressions—a process familiar to everybody in daily life. How many people habitually close their eyes when they wish to appreciate music fully, striving to subordinate all impressions to that of sound, the appreciation of which then rises in intensity above that of the rest. Similarly a surgeon will often fix his eyes on some distant object so as to let nothing distract attention from his tactile sense which is at that moment engaged in giving an impression of some intra-abdominal disorder. *In this fixation of attention we have, I am convinced, the key to the problems of hypnosis.* The attention is fixed on some point—for example, a bright disc—and is then readily transferred to the ideas and sensations suggested by the experimenter.

Let us now examine the readiest means of so fixing a person's attention as to induce hypnosis and consider the experimental phenomena that can be demonstrated in that condition. As a matter of fact, to anybody who has not had previous experience of hypnotic experiments and is anxious to induce hypnosis the subject is at first of greater importance than the method. There are a large number of people who are readily able to "stop thinking" and to fix their attention at will. Such people are usually in the best of health, unaccustomed to worry over trifles, and do not know what it is to have disturbed sleep or difficulty in getting to sleep. They are "susceptible to hypnosis" and may be found most frequently, as one would suppose, in the healthy working male population between the ages of 15 and 30 years. The experimenter, therefore, should find such a subject and explain to him the nature of the proposed experiments. On no account begin with people in feeble health or who are "neurotic"; males being preferable to females. And having made himself familiar with the described phenomena of hypnosis he should decide which of these he wishes to obtain in the first experiment. This is where so many fail.

Hypnosis may be very roughly divided into three stages, namely—1. A condition of drowsiness and inability to open the eyes when forbidden to do so. 2. A dream-state in which various ideas suggested appear to the subject as if in a dream or picture. In both these stages the subject is quite aware of his surroundings and that he is being made the centre of an experiment. He feels lethargic and disinclined to move and that he cannot move his eyelids or limbs when told not to do so by the operator. 3. In the third stage the attention has been so completely distracted from present surroundings that the subject has fallen into a condition of sleep. In this state he is peculiarly amenable to suggestion, will talk when spoken to, and will describe various hallucinatory scenes that are suggested to him; and may walk about and take active part in these imaginary scenes. This is what is described as *Somnambulism* and is a condition in which an infinite variety of hallucinations may be suggested—visual, auditory, and æsthetic. When complete the subject has no subsequent recollection of his hallucinations. A characteristic condition that can usually be produced in almost any stage is that of Catalepsy; if the subject's attention be directed to any limb and it is suggested that the limb is becoming stiff an extraordinary rigidity will result, of variable duration, and for the time being quite preventing any voluntary movement of the limb affected.

Now it should be obvious that it is too much to expect that the beginner in his first experiment will succeed in producing the deeper stages of hypnosis. He must be satisfied if after many attempts he succeeds in preventing the subject opening his eyes when told he cannot do so. Experience shows that some really susceptible subjects are not much influenced at the first sitting. The novelty of the experiment and the unusual requests made as to behaviour tend to produce at first a state of unrest rather than of calm. However, people very soon get accustomed to the process and the deeper stages can often be obtained at the third or fourth sitting. It is best to follow out a scheme in the experiments such as the following, which was arranged by me for the benefit of practitioners who ask for instructions in the technique of hypnosis.

Instructions for inducing hypnosis.—Carry out a series of eight experiments, each of which will undoubtedly consist of several attempts to obtain certain phenomena; these should be repeated until the required result has been obtained. The experiments are: (1) to get used to the necessary details as to surroundings and technique of the process, and, further, then to attempt the production of stiffness or immobility in the subject's eyelids; (2) to induce hypnosis by a modification of Braid's method of fixed gazing; (3) production of the intermediate dream-state; (4) to obtain passive somnambulism; (5) to change this passive state into a condition of active somnambulism; (N.B., these experiments include the investigation of altered sensibility (analgesia and anæsthesia) and the production of catalepsy; (6) demonstration of post-hypnotic influence; (7) hypotaxy or fascination; and (8) hypnosis by passes. Space will not permit me to enter into a detailed description of the above course of experiments, consequently I must be content with mentioning a few of the more important points. The instructions I give for the first experiment are briefly as follows.

Experiment 1.—1. Seat the patient in a comfortable arm-chair with his back towards the light and see that he is comfortable in every respect, especially that his head and neck are not in a strained position (this happens with so many chairs that *look* comfortable). 2. Tell him that when you say "Now" he is to close his eyes and not to analyse his sensations nor to resist the feeling of loss of contact with his surroundings that will tend to overcome him. 3. Place the thumb of the right hand on the centre of the subject's forehead, resting the fingers in the left temporal region. 4. Suddenly press firmly with the thumb, at the same time drawing it downwards towards the root of the nose. Then say, "Now close your eyes," in a quiet but very clear and firm voice. 5. Repeat the friction movement with the thumb several times rapidly (four or five movements may be sufficient). 6 Remove the hand quickly and say, "You *cannot* open your eyes, they are very stiff—firmly fixed—and you *cannot* move the lids."

Result of experiment.—1. At first the subject will probably open his eyes with very little difficulty, but you assure him that they were stiff and did not open as quickly as usual. 2. Repeat the experiment half a dozen times. 3. Above all, *be confident*. Let your subject know that it is only a matter of time; that very shortly he will be unable to open his eyes when you tell him he cannot. 4. With a susceptible subject you will find that the eyelids become stiffer at each attempt, then there will follow a *momentary* inability to open them, and finally, absolute closure which remains until you tell the subject he can open his eyes again. Having done this you will have got over the first stage successfully, and, what is extremely important, you will have gained a vast amount of *self-confidence*. (N.B.—1. Throughout the experiment let your manner be quiet, sure, and decided. 2. Let there be no hurry and no manifestation of impatience. 3. Should the subject open his eyes readily, be quite unperturbed, and say as firmly as before "Just once more, if you please," or words to that effect. 4. If you are losing confidence postpone the experiment to another day. 5. In any case do not prolong the first experiment over half an hour.)

Experiment 2.—The second experiment deals with the

induction of hypnosis by making the subject gaze at a bright object held about 12 inches above, and in front of, his eyes. A convenient form of hypnoscope consists of a bright disc or mirror about one inch in diameter, mounted on a dull black surface from six to eight inches in diameter. The subject is told that by gazing at the disc he will become drowsy and eventually fall asleep; his attention being fixed on the disc and then by suggestion directed to the idea of sleep which you endeavour to make dominant. Braid originally let his subjects gaze at a bright object until they became spontaneously hypnotised, but this method takes a much longer time than if combined with suggestion, and, moreover, is frequently followed by an unpleasant congestion of the patient's conjunctivæ. Having once obtained drowsiness and stiffness of the eyelids by either of the above-mentioned methods, it will be found possible with well-chosen subjects to produce subsequently the deeper stages. But at first it requires infinite patience and confidence, and a good deal of disappointment is often felt because the subjects will not fall into deep somnambulism at the mere bidding of the tyro. After considerable practice it will be found that the more adroitly the suggestions are given the more readily can the subject be led into the deeper stages of hypnosis. And whereas at first it will be found almost impossible to produce anything approaching anæsthesia, after some experiments analgesia will be produced in quite a large number of subjects; sufficient, indeed, for the painless performance of various minor operations. These points are best illustrated by an account of actual experiments. I extract the following from my notes:—

A. Subject—man, aged 21 years. Had been a hairdressers' assistant. Fatigued his eyes with disc. Produced no sleep but slight stiffness of eyelids. Several more attempts were made to induce hypnosis by making a sudden pass in front of his face, whilst his eyes were fixed on my ring. This was eventually successful, so that half an hour from the commencement of the experiment he was in a condition of somnolence but very easily roused. I was unable to produce rigidity of the arm, nor could I obtain the phenomena of somnambulism. Again induced hypnosis and then suggested that on opening his eyes he should find himself in the last shop he had worked at. This was successful; he described a "wheel" which he said he saw in a corner of the room. I found he meant the apparatus which is used for hair-brushing. He did not see anything else but responded in part to several similar suggestions.

Up to this time the subject had apparently been in the intermediate or dream-stage as he subsequently could recollect having seen these various things as if in a dream, being aware of the fact that he was seated in my room. But he then evidently became somnambulic as he had no recollection of the succeeding incidents, which occurred as follows. 1. Having recalled the "wheel" to his mind, I told him to turn it; he went towards the imaginary machine and made movements appropriate to wheel-turning. 2. I told him to write down his name and address, which he did. He was very surprised afterwards when I showed him the paper. 3. I succeeded in producing transient catalepsy of one arm. 4. I produced analgesia, which, however, I do not think was complete. In subsequent experiments the deeper phenomena of hypnosis were readily obtained. He was very susceptible and became somnambulic in the first experiment, although care and patience were necessary to induce this stage. A beginner would be fortunate to find so good a subject for his early experiments.

B. Subject—youth, aged 18 years. Found him a difficult subject to influence, but by varying my methods I gradually induced the earlier stages of hypnosis and obtained an early phase of the dream-state. He was quite aware of his surroundings but happened to be a good visualist, so that I could successfully throw various pictures on to the mental screen.

With this subject I was unable to obtain a permanent somnambulic stage until the fifth experiment or sitting. And even then several more experiments were necessary before I could elicit the phenomena of active somnambulism. However, he eventually became deeply somnambulic and is of peculiar interest, because although he will accept readily the majority of hallucinatory suggestions, yet he maintains a definite choice of action in regard to acts that he does not approve of, or which seem to be absolutely incongruous. For example, I accidentally discovered that he was a teetotaler by offering him an imaginary glass of beer. For a long time he refused to drink it, but eventually, after persuading him that it was extremely mild and that he was doing it to please me he decided that he would drink it. He would not agree to drink anything stronger.

On another occasion I told him that he was a milkman serving customers and then that he ought not to serve out white paint for milk. In return for this I was abused roundly—he said that he would not serve me with milk again as it was waste of time. He refused absolutely the suggestion that he was taking round paint. I persisted, however, and after getting several witnesses to act as imaginary customers and each to tell the subject that he was serving out paint instead of milk, he began to waver. He argued at great length that the milk was all right and in imagination drank a glass to show that this was so. He admitted that it smelt of paint and decided to take it back to his "guv'nor."

The interest of this experiment lies in the fact that the subject possesses considerable initiation if he likes to exert it. If you place him in an imaginary scene he will *rationally* act that scene, behaving with the same propriety and common sense as he would in everyday life.

These notes show how hypnosis was induced, and subsequently deepened, in two healthy young men chosen by mere chance for the purpose. They were aware of the nature of the experiments and were perfectly willing subjects.

May I repeat that by following out some plan of experiments similar to the above anyone interested in hypnosis can investigate the condition for himself. And whoever does so will see that far from being an extraordinary mastery of one will over another hypnosis is rather a simple state of distracted attention which can frequently be terminated by an effort of will on the part of the subject, but is, indeed, a condition in which suggestion has remarkable force by directing the attention to some idea which then becomes dominant for the time being. For example, a person has some pain; you tell him he has *not* but your suggestion makes no difference to his sufferings. You hypnotise him—that is, you distract his attention from his surroundings, including the pain—and he no longer suffers. By suggestion you raise in his mind the idea that his pain has entirely gone; this idea becomes dominant and eventually persistent, so that in waking he no longer has pain; the idea of *pain* has been dominated by the idea of *no pain*—they cannot be coexistent. In this way those who take the trouble to investigate the condition soon perceive what an important therapeutic agent we have ready to hand in hypnosis.

During the past few months my own experiments have been chiefly devoted to the investigation of methods of induction and of the experimental phenomena, but I have had opportunities of testing the efficacy of suggestion during hypnosis in several cases presenting various functional neuroses and have been more than satisfied with the results. Of course, there are limitations to the employment of this method. It is not applicable in the wards of a general hospital. Personally, I find the same difficulty, if not impossibility, of inducing hypnosis in a hospital ward as I did when first using hypnosis some years ago. This is undoubtedly because the patients' attention is distracted by their surroundings and the knowledge that they are for the time being an object of interest to everybody in the ward. On the other hand, I have known patients who have been refractory in the ward become readily influenced when treated in a quiet room apart from the other patients. Consequently, unless some special arrangement is made for treatment by this method its use in hospital will be productive of disappointment. Of course, in institutions where hypnosis is the rule rather than the exception these difficulties are not met with, as in Bernheim's hospital at Nancy, where he hypnotised large numbers of patients at every visit. Again, under certain conditions hypnotic analgesia would be extremely useful in minor surgery and in operations on the nose, throat, or eyes, to say nothing of dental extractions. But at present we have no certain method of rapidly inducing hypnotic anæsthesia and several sittings are necessary to obtain a satisfactory result; so that, although it certainly could be used with advantage for this purpose in private practice, it is doubtful if it will ever be used to any great extent in hospital work. The advantages of this form of anæsthesia for such operations as I have indicated are its absolute safety, that it can be prolonged indefinitely at the wish of the operator, and for operations in the mouth the jaw can be fixed open without the use of a gag. Moreover, reflex struggles can be entirely avoided by giving the necessary suggestions.

In conclusion, I trust that these brief notes will be helpful to many practitioners who are anxious to make use of hypnotic suggestion in their work or who want to investigate the condition from the purely psychological standpoint. Also, I shall be glad if they will help to place the subject of hypnosis on a more rational and satisfactory basis. In the scores of hypnotic experiments I have made I have never seen anything which would lead me to suppose the existence of any "mysterious" influence between the operator and his subject; neither have I seen any untoward results happen to my subjects. It seems such a pity that the majority of us in practice have neglected such a powerful therapeutic agent because we have not taken the trouble to understand it properly. No doubt when it is recognised that the keynote of hypnosis is an artificial distraction of "attention" and not an uncanny influence, the usefulness

of the condition will be more thoroughly appreciated by both the profession and the public.

Duchess-street, W.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTE ON A CASE OF PARAMYOCLONUS MULTIPLEX WITH FIBRILLARY TREMORS.

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THE patient, a male, aged 32 years, was admitted to Bradford Royal Infirmary under the care of Mr. T. Wilmot. The patient had not worked for about 15 months. He gave up work on account of general weakness. For about 12 months he had had violent twitchings of his muscles. They began in the muscles of his leg but rapidly involved the shoulder muscles. The contractions caused no pain. He was able to get about but could only walk slowly and with great care. He had never fallen. For the last five months he had been almost constantly in bed. Otherwise he had nothing to complain of. There was no history of fits or of any nervous disease in the family.

On admission the patient was found to be a well-nourished man. The temperature was 98·4° F. and the pulse was 80. As he lay in bed he was suddenly seized with extremely rapid muscular contractions of the muscles of all his extremities and of both platysmas. The face, with the exception of the platysmas and the depressor anguli oris, was not affected. In the arms the muscles most affected were the deltoid and triceps, in the back the trapezei and latissimi dorsi. Occasional twitchings were seen in the flexors of the forearms, but they were not nearly so frequent or so violent as those of the muscles of the shoulder girdle. When the patient sat up slight twitching could also be seen in the erector spinæ. In the legs the quadriceps extensors were much the most affected. The hamstrings were affected to a much less extent. Contractions could also be seen occasionally in the tibiales antici. In both quadriceps extensors fine, fast, fibrillary tremors could be frequently seen though they were not constant. The same tremors, though to a less extent, could be seen in both deltoids. The contractions were extremely rapid, quite painless, and generally symmetrical, though at times, especially the contractions of the muscles of the forearm and leg, were limited to one side. The right platysma was more affected than the left and here frequently numerous contractions followed one another and seemed to end in a short tonic contraction. Voluntary movement for a time inhibited the contractions, but in a few seconds they began again—e.g., the patient could touch his nose with his forefinger accurately, but if he continued to do so the movements commenced again and soon became more violent than before. The patient's gait was normal though slow. While walking the movements of the legs ceased but those of the trunk continued. Romberg's sign was negative. The movements quite ceased in sleep. There were no paralysis, no rigidity, and no wasting of any of the muscles. The superficial and organic reflexes were normal. The knee-jerks were markedly exaggerated. There was no ankle or rectus clonus. Sensation was absolutely normal. There was increased motor and electrical excitability of the quadriceps extensors and the deltoids, otherwise the electrical reactions were normal. The cranial nerves were quite normal; there was no nystagmus. The fundi oculorum were normal; the mental condition was quite normal; the heart, the lungs, &c., were also normal. The patient was treated with galvanism to the spine and a mixture containing belladonna and arsenic. On June 26th the movements were as before but he had become somewhat excited. His pupils were moderately dilated and very sluggish to light. He had also developed an erythematous rash on his back. He was taken off the belladonna and put on bromide. On July 2nd the pupils reacted; the movements were as before. His mental condition was normal. On the 5th the patient went out at his own desire *in statu quo*.

I am indebted to Mr. Wilmot, medical officer to the Bradford Royal Infirmary, for permission to publish this case.

Bradford.

NOTE ON A CASE OF UPWARD AND BACKWARD DISLOCATION OF THE CLAVICLE.

BY L. ERNEST ACOMB, M.R.C.S. ENG., L.R.C.P. LOND.,
HOUSE SURGEON TO THE MIDDLESEX HOSPITAL, LONDON, W.

THE patient, a spare, well-grown man, 55 years of age, whilst crossing the road was knocked down by a hansom cab. He remembered being struck on the head and was assisted to his feet in a dazed condition and accompanied to his home by a friend. He sustained a scalp wound which bled profusely, but was unaware of any injury to his shoulder until the following morning, when he found that his left shoulder was painful, and in order to relieve the pain somewhat he had to support his elbow. He was able to raise his arm slightly, but this movement caused great pain.

On examination the left shoulder drooped forward and there was a depression in place of the prominence caused by the forward convexity of the clavicle. The articular facet of the acromial process could be distinctly felt, while the acromial end of the clavicle projected backwards under the skin covering the suprascapular fossa. The distance from the acromial end of the clavicle to the coracoid process measured on the left side four inches and that on the right side three inches. There were some swelling and bruising of the part. The sternal articulation of the clavicle appeared to be in no way affected. Reduction without a general anæsthetic was found to be impossible, the acromial end of the clavicle being apparently entangled amongst fibres of the trapezius. Under chloroform reduction was effected, but the bone could not be retained in the proper position.

The patient was admitted into Middlesex Hospital on April 27th, 1906, under the care of Mr. A. Pearce Gould, who, on April 30th, wired the outer end of the bone into position. Mr. Gould made a curved incision so as to enclose the projecting outer end of the clavicle within the concavity of the incision. The end of the bone was found to have separated the fibres of the trapezius and to have become entangled within them. The bone was disentangled and holes were bored in the acromion process and the outer end of the clavicle respectively; a soft wire was then passed through, twisted tightly, and the ends cut short were battened down. The patient made an uninterrupted recovery and when discharged on May 17th could use the arm well, the movements daily improving. When he returned from the convalescent home three weeks later he could raise his arm as high above his head as on the uninjured side.

The most usual dislocation of the clavicle is at its outer end, with the acromial facet resting on the upper surface of the acromion process. In this case the outer end of the clavicle had passed much further back across the whole length of the acromion and was resting on the spine of the scapula. The whole of the coraco-clavicular ligaments must have been torn across. I cannot find a similar degree of displacement recorded by any of the surgical authors to whose works I have access.

I am much indebted to Mr. Gould for allowing me to publish this case and for his help in these notes.

Reviews and Notices of Books.

Physiology of the Nervous System. By J. P. MORAT (Lyons). Translated and edited by H. W. SYERS, M.A., M.D. Cantab. With 263 illustrations (66 in colours). London: Archibald Constable and Co., Limited. 1906. Pp. 680. Price 31*s.* 6*d.*

THE French treatise on physiology by Professor Morat and Professor Doyon is well known to all physiologists in its native garb. The translator has selected the volume dealing with the nervous system and perhaps wisely, for Professor Morat's name first became well known to English physiologists more than two decades ago by the joint work done

by Morat and Dastre on the sympathetic nervous system. The work is divided into two parts, Part I. dealing with elementary nervous functions, occupying a little over 100 pages, while Part II. treats of elementary systematic functions.

The first part deals with general nerve physiology, here many of the illustrations and apparatus are taken from Waller's Physiology. By far the most interesting section is that on systematic functions which originate in the associations and definite relationships established between the cellular functions.

The scope of the second part will be best understood by referring in broad terms to its subject matter under the head of Sensibility and Movement: their Relations. Under this head spinal and cranial nerves are dealt with. Following on this are what the author calls "primary systematisations," which include such subjects as reflexes, inhibition or arrest of reflexes, and classification of nerves. This leads to a study of "Consciousness and Unconsciousness," including such subjects as dispersion and reflexion of the excitations, the great sympathetic nervous system, transmission and centralisation of stimuli, and the medulla oblongata. Under the head of "Superior Systematisations" the following problems are discussed: orientation and equilibrium; the functions of the cerebellum; the emotions and intelligence; cerebral localisation; specific innervations, including the sensory field, tactile innervation, and the muscular sense; visual innervation; auditory innervation; olfactory and gustatory innervation; and, lastly, language and ideation. The author assumes the existence of the neuron as the static unit of the nervous system, but looks on this cellular unit as a *symbiosis* in the sense that to the fundamental cell, of which it consists, others are added which in a way form one structure with it. Corresponding to this unit, the author postulates a dynamic unit "by the unsatisfactory name of elementary nervous irritability." We find the word "force" used and applied as "chemical," "caloric," and "electric."

Professor Morat it will be seen treats his whole subject in a novel and original way. Proceeding from the simple arrangement of spinal nerves he gradually evolves his matter in a most interesting manner, setting it forth with all the precision and clearness that characterise the writings of a cultivated Frenchman. Numerous anatomical illustrations—many from Poirrier and Charpy and van Gehuchten—greatly aid the reader in the chapter dealing with the cranial and other nerves. A very terse and explicit account is given of the spinal and other reflexes of the cord and the sympathetic system; all these subjects are illustrated by numerous diagrams, some of them in colour. A remarkably vivid picture is that (Fig. 129) showing the effect of stimulation of the cervical sympathetic in the dog on the blood-vessels of the mucous membrane of the mouth and tongue. Better illustrations are given of the effects of removal—whole or partial—of the cerebellum than are given in English books. We refer to the results of Luciani and Thomas. In connexion with localisation in the cortex, as defined by Sherrington and Grünbaum by the unipolar method, we failed to find a sketch of the cortex cerebri showing graphically the disposition of the motor areas in the anthropoid apes. In connexion with auditory innervation the author adopts the classification of Bounier and treats of the barræsthetic, manæsthetic, and seisæsthetic functions of this apparatus—terms which so far have not found a place in English text-books. There is a fairly complete bibliography appended to each chapter.

We welcome this translation as it introduces many new ways of looking at nervous activity in its various forms, while it may be regarded as setting forth the views of one whose name stands high both as an investigator and expositor amongst contemporary French physiologists.

Preservatives in Food and Food Examination. By JOHN C. THRESH, M.D.Vict., D.Sc. Lond., F.I.C.; and ARTHUR E. PORTER, M.D., M.A. Cantab. London: J. & A. Churchill. 1906. Pp. 484. Price 14*s.* net.

THE important question of preservatives in food has been strongly revived by the recent meat trade scandals; and owing perhaps to the same disclosures certain of the recommendations of the Departmental Committee on Food Preservatives, which was appointed in 1899 and which reported in 1901, have received official recognition, since not many weeks ago the Local Government Board issued a circular to public health authorities and others asking for their coöperation in stamping out the practice of preserving milk with antiseptics.

At first sight the book of Dr. Thresh and Dr. Porter would appear to have been written in defence of the preservative. In the preface, for example, they express the opinion that the dangers arising from the use of preservatives have been greatly exaggerated. Further on, however, they admit that certain preservatives, either from their quality or from their use in excessive quantity, have an injurious effect upon health, and that the further increase in the use of preservatives may by their cumulative action deleteriously affect certain organs or insidiously undermine the constitution. The authors therefore approach the subject in the right spirit, anxious as far as possible to elucidate the truth. As far back as 1897, in a special commission on the subject, we expressed the opinion that in certain circumstances and in certain foods a minimum quantity of a given preservative might be allowed, and that it should be the duty of the legislature to protect the public against the abuse of such a concession. The recommendations of the Departmental Committee appeared four years later and were practically in agreement with this view. They proposed the prohibition of any antiseptic whatever being added to milk, or infant and invalid foods. They suggested that a limited quantity of borax might be allowed in cream and butter or salicylic acid in wine, but ruled out the use of formaldehyde entirely as well as the addition of copper salts to peas. These recommendations made five years ago are, unfortunately, still recommendations; they are often regarded, however, as semi-official and proceedings in the police courts are accordingly based on them with the result that the most diverse decisions are given. It is not difficult to gather from their treatment of the subject that Dr. Thresh and Dr. Porter on the whole favourably regard the conclusions of this committee, and we think ourselves that the report was an excellent and able one, threatening no hardships to any man and providing means for the protection of the public against an abuse of privilege.

One aspect of the subject, we suggest, has escaped the authors. "It would certainly be strange," they write, "if with the advance of scientific knowledge better preservatives could not be discovered than those which were originally discovered by uncivilised or semi-civilised man, yet the old preservatives are permitted without question although some of them are more deleterious if taken in immoderate quantities than their more modern substitutes." The authors have surely forgotten that the fact that a ham or a haddock, for example, is preserved with smoke is patent to everybody, there can be no deception about it. None, however, but the scientific analyst can decide whether food is preserved with borax. Modern preservatives, of which the authors speak, are, in fact, "silent" in the sense that, as a rule, they possess no taste or smell which would reveal their presence. Moreover, smoke not only preserves meats but gives them also a flavour which is esteemed. Smoke and salt are thus in the same class, inasmuch as they are condiments as well as preservatives. We do not imagine that

everybody would hold that borax and salicylic acid are in any sense condiments. Vinegar, again, is an old-fashioned preservative, but what would pickles be without it or with borax added instead? The fact, too, that "modern preservatives" are more potent than the old-fashioned antiseptics constitutes a source of danger. We cannot think that the argument in favour of the use of "modern preservatives" is helped a tittle by stigmatising smoke, salt, vinegar, and so on as preservatives the harmlessness of which may be open to doubt because "they were originally discovered by uncivilised or semi-civilised man."

Dr. Thresh and Dr. Porter's book will be valued also by readers for its excellent chapters on the methods and substances commonly used in the preservation and colouring of foods as well as for the sound directions given for the detection of such preservatives. It is almost needless to add, when the wide experience which both authors have had in dealing with epidemics arising from the consumption of unsound food is recognised, that the chapters on such subjects as ptomaine poisoning, public abattoirs, contaminated shell-fish, watercress, and so on, are full of points of the greatest interest to all those concerned in the protection of the public health. There is, in fact, no more important branch of the public health service than that with which this volume deals, and the subjects are approached from a completely modern point of view.

The Operative Treatment of Fractures. By W. ARBUTHNOT LANE, M.S. Lond., F.R.C.S. Eng., Surgeon to Guy's Hospital, and Senior Surgeon to the Hospital for Sick Children, Great Ormond-street. London: The Medical Publishing Company, Limited. 1905. Pp. 144. Price 7*s.* 6*d.*

No surgeon will deny that some cases do occur in which a fracture has permanently impaired the utility of a limb, even though the broken bone has firmly united, but there will certainly be differences of opinion as to the proportion of cases in which the ultimate result of the ordinary treatment of a fracture is unsatisfactory. Mr. Lané holds that the proportion is large, while most surgeons believe that the percentage of cases is very small. Probably the truth lies between these extremes. It is, however, certain that the introduction of the x rays into surgery has somewhat shaken the complacency with which we were wont to regard the result of the splint treatment of fractures, for skiagrams show us that malplacements are by no means rare. Mr. Lane is strongly in favour of wiring or screwing the bones in all cases likely to prove unsatisfactory, so as to insure an accurate apposition of the fragments. The advantages of the operative method are obvious but its disadvantages, or possible disadvantages, are equally clear. To wire or to screw a simple fracture is to convert it into a compound fracture and the possible septic results of such a conversion include some which are very serious, but the author claims that "if due care be taken and reasonable skill be exercised the risk is practically *nil*." We doubt if most surgeons will subscribe to this opinion. It is, however, certain that with great care the risk is very small and in some cases it is well worth while to run this risk in order to obtain the benefits of wiring and this work gives a useful account of the methods employed.

The book is printed in a very large type, technically known as "great primer," and in demy quarto size, having only some 200 words on each page. Such type is pleasant to read and forms a marked contrast to the small type so widely used nowadays, but we think that the quarto size is a little unwieldy. It is a pity that no index has been provided.

LIBRARY TABLE.

Guide to Promotion for Non-commissioned Officers and Men of the Royal Army Medical Corps, with Appendix on Hints for Young N.C.O.'s on Clerical and Other Duties in a Military Hospital. Compiled by Captain S. T. BEGGS, M.B.R.U.I., R.A.M.C. (Militia). London: Gale and Polden. Pp. 303. Price 3*s.* 6*d.* net.—Captain Beggs hopes that this guide will fulfil a useful purpose in the corps and induce men to study for promotion. The special features of the little book are (1) the concise form in which the information is put by questions and answers; (2) the illustrations of surgical instruments and appliances; and (3) the assistance which it is hoped will be derived from the "Appendix" in supplying a guide to young non-commissioned officers, recently promoted, who may have had no experience in routine clerical duties prior to promotion. In preparing the appendix, in the compilation of which the author acknowledges a debt to Sergeant-Major J. Tewkesbury, R.A.M.C., the following points are considered: How to take over charge of a military hospital, the clerical duties carried out by a non-commissioned officer, and the many questions which concern official papers and returns in a military hospital. The body of the book is divided into two parts and addenda. Part I. deals with infantry squad drill, stretcher drill, discipline, duties in barracks on guard and piquet, duties in camp and on the line of march, the duties of ward-orderlies and of wardmaster, the mode of carrying wounded men off the field, the immediate treatment of cases of emergency, the method of regulating the ventilation of wards, and with surgical instruments and appliances. Part II. contains additional information necessary for promotion to sergeant; it deals with transport duties and company drill (the subject-matter of these chapters being supplied by Messrs. Gale and Polden), hand-seat drill, ambulance-wagon drill, the additional duties of wardmaster, and the duties of a steward. In the addenda lists of instruments required for emergency and other important operations are given, as well as a list of the medical and surgical equipment for regimental units. From this *précis* of the contents the scope of this useful work will be seen, and it should be added that the information is given in a straightforward way. The illustrations are supplied from the blocks used by Messrs. Evans and Wormall in illustrating their catalogue of surgical instruments.

A Text-book of Botany. Part I. The Anatomy of Flowering Plants. By M. YATES. London: Whittaker and Co. 1906. Pp. 147. Price 2*s.* 6*d.* net.—This little book has been written primarily to meet the requirements of the author's own pupils in preparing for examination. It will, however, be found useful to anyone who wishes to obtain a practical acquaintance with botany without the aid of oral teaching. The book is of a suitable size for the pocket and is divided into chapters, each dealing with some particular part of a flowering plant. The derivation of the terms used is given and in nearly every case a little sketch (413 in all) helps to make the definitions clear. The arrangement of the chapters is a useful one for reference, and if the book is used as it is intended to be used—namely, to supplement practical work—we can find no fault with it. The danger of such books being used for cramming purposes should not, however, be lost sight of. The list of questions set by various examination syndicates which is given at the end of the book adds to its usefulness, but is suggestive in the direction just indicated.

Nomenclature Anatomique en Quatre Langues. (An Anatomical Vocabulary in Four Languages.) By Dr. PAUL RODET. Paris: Masson et Cie. 1906. Pp. 76. Price 1 franc 50 centimes.—In this well-arranged and useful little book Dr. Rodet has collected the Latin, French, and English equivalents of upwards of 2200 anatomical terms, and English readers of French medical literature will find it excellent for reference when an unfamiliar word of this class presents itself. He has taken as the basis of his

system the Latin anatomical nomenclature adopted by the Congress held at Basle in 1895 for the purpose of considering the use of Latin in the medical terminology of German-speaking countries. Each page is divided into four columns, the first of which contains the Latin text, while the other three show the corresponding terms in French, English, and Esperanto. The English portion is by no means free from typographical errors or inelegancies. For instance, on p. 1 the nasal spine of the frontal bone appears as the "nanal spine," on p. 3 the word "line" is divided as if it were a dissyllable, and the carotid groove of the sphenoid bone is given as the "carotic groove"; on p. 4 the word "face" is divided like a dissyllable; and on p. 7 the semi-lunar bone of the carpus is given as the "lunar bone." Again, the radial nerve of the English anatomists is a sensory nerve in the forearm, but the *nerf radial* of French anatomists includes the upper sensory-motor portion of the same nerve. These, however, are minor blemishes in a meritorious production, and are not likely to embarrass English readers.

Lectures on Midwifery for Midwives. By A. B. CALDER, M.B., M.R.C.S., Lecturer on Midwifery to the London County Council and to St. Mary's Midwifery Training School, Fulham. With 153l illustrations. London: Baillière, Tindall, and Cox. 1906. Demy 8vo. Pp. xii.-274. Price 5*s.* net.—In response to the request of some of his pupils the author has published his lectures on Midwifery for Midwives "just in the words they were delivered to the class." The result is this little book, which contains all that is required to be known by an aspirant for a certificate of the Central Midwives Board. It is a difficult matter to write a book of this kind but Dr. Calder has certainly succeeded exceptionally well and we are not surprised that his pupils should have desired to have such excellent lectures in a permanent form. The author has carefully avoided going into too much detail but has left out nothing of importance. The chapters which we think most admirable are those on infant feeding and asepsis. The difficult subjects of the modification of cow's milk and bottle feeding are very clearly described and the reasons given for the various steps recommended. With the author's remarks on the various patent foods on the market we entirely agree: as he rightly says, "the delusive attractions of most patent foods are the simplicity of their preparation, and their digestibility, and therein lie their dangers; for the enthusiastic mother, when she uses them, usually feeds her child on too concentrated food and in too large quantities; as she discerns the expanding ability of the babe to imbibe them, and the physical results as exhibited in pounds avoirdupois." The rules laid down by the author for the prevention of septic infection (which he summarises in the form of a table) are especially good and would well bear inclusion in many text-books intended for the use of medical students. As he truly says, the midwife should ever remember "to regard the period of labour as the time the patient is undergoing an operation, when wounds are being made which have to be kept aseptic, and the puerperium as the time when these wounds are repaired by being kept surgically clean." On the whole it is one of the best books of its kind which we have read. It is a pity that the illustrations are crowded together on separate sheets and are unworthy of the excellent letterpress.

Heath's Manual of Minor Surgery and Bandaging for the Use of House Surgeons, Dressers, and Junior Practitioners. Thirteenth edition. Revised by BILTON POLLARD, F.R.C.S. Eng., Surgeon to University College Hospital and Teacher of Operative Surgery in University College, London; Member of the Court of Examiners of the Royal College of Surgeons. London: J. and A. Churchill. 1906. Pp. 409. Price 6*s.* net.—What can be said about a book which has reached the thirteenth edition? It must have supplied a want and it must be appreciated by its readers. The only essential for the continuance of a popularity such as this is that the book should be kept fully abreast of the times. Mr. Pollard has in the present edition, as in the one immediately preceding it, brought the work fully up to date without destroying its original characteristics. It will prove as useful as ever for dressers and house surgeons, and many a young practitioner will find the hints given in this book of immense value in his daily work.

Baby: Useful Hints for Busy Mothers. By EDITH L. MAYNARD, Certificated, London Obstetrical Society; late Sanitary Inspector, Sheffield. With an Introductory Note by JOHN ROBERTSON, M.D., B.Sc. Edin., Medical Officer of Health of Birmingham. Bristol: John Wright and Co. 1906. Pp. 31. Price 1*d.*—The ignorance which exists even amongst better-class mothers on the feeding and upbringing of a baby is a most extraordinary thing. The dangerous habits of the lower-class mother in regard to the feeding of her babies are well known, and we are often tempted to wonder whether the ignorance is not sometimes assumed and in reality is merely a cloak for criminal neglect. It is needful, however, not to pass too harsh a judgment on the parents of the unhappy children who suffer so terribly from the ignorance, whether it be assumed or real, of their mothers. In this little pamphlet the author has tried to give a short and trustworthy description of the right way to feed and to rear an infant. It is an endeavour to teach those mothers who, through no fault of their own, adopt methods quite dangerous to the babies for whom they are anxious to do right. It is the unfortunate bottle-fed babies who die and, as Dr. Robertson points out in his preface, in his own district during the summer, over 30 times more bottle-fed babies die than breast-fed ones, from an equal number of babies in each group. Miss Maynard has succeeded in describing in clear and simple language all that a young mother should know about the care and feeding of her baby. The directions are so good and easy to follow that no one should have any difficulty in understanding them and a perusal of this little pamphlet would do much to save the lives of many improperly fed babies. It is just the kind of book to place in the hands of district nurses and midwives for distribution amongst their patients.

A Manual of Veterinary Therapeutics and Pharmacology. Second edition. By E. W. HOARE, F.R.C.V.S. London: Baillière, Tindall, and Cox. Pp. 779. Price 15*s.*—The work has been re-written, and no one comparing it with the first edition could possibly recognise it as an extension of the same work. The first edition, if we recollect aright, was arranged on identically similar lines with a Pharmacology and Therapeutics written for human medical students by Dr. J. Mitchell Bruce; in fact, the two when placed side by side, except for the posology, appeared to emanate from the same pen, so much were they alike in their columns and paragraphs. The present work is modified both in its wording and its arrangement in every direction. The subjects of materia medica and pharmacological action, as far as the specific details of the preparation of the drugs are concerned, have been rather scantily treated, and we fear this will be detrimental to the book from the student's point of view, but it is the veterinary practitioner who will really appreciate the work. The author writes as a practitioner, and if he is superficial when dealing with pharmacological actions he is none the less thorough in his applied therapeutics. The chapters on the care and management of sick animals and on the treatment of numerous diseases are complete from the practical standpoint, and in the appendix are many formulæ and prescriptions that will prove of greatest service to veterinary surgeons.

JOURNALS AND MAGAZINES.

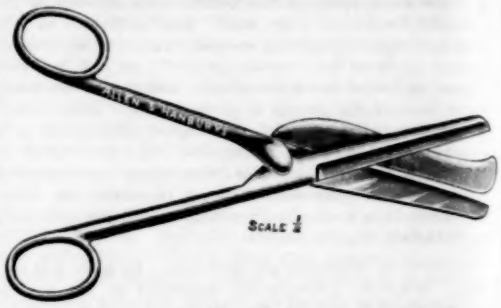
Ophthalmology. Edited, with the aid of a staff, by H. V. WÜRDEMANN, M.D., of Milwaukee. Vol. II., No. 4. July, 1906. Issued quarterly. Price 6s. per number or £1 1s. per annum. Editorial Office, 105, Grand-avenue, Milwaukee, Wisconsin, and to be obtained from George Keener and Co., 16A, Red Lion-square, London.—The original articles contained in this number are: 1. Ocular Injuries from Glass and Stone, by William H. Sweet, M.D., of Philadelphia. The author shows that notwithstanding the difficulty of obtaining a shadowing of a particle of glass or stone and localising it by means of the Roentgen rays, it may with care be successfully accomplished, and skiagraphs of small fragments of various particles are given as well as drawings showing the relations of the orbital bones to the globe of the eye. 2. Some Observations on Worth's Methods of Treatment of Convergent Squint in Young Children, by Linn Emerson, M.D., of Orange, New Jersey. The author deals exclusively with concomitant-convergent squints, which he regards as due to deficiency or absence of the fusion sense. The principles of treatment he adopts are optical correction; occlusion of the fixing eye; the use of atropine in the fixing eye; training of the fusion sense; and finally operation. 3. A Cure of Convergent Strabismus by Orthoptic Treatment at 20 years of Age, by H. V. Würdemann, M.D. 4. A Secure Looped Single-stitched Advancement Suture with a Consideration of Scleral Anchorage, by Mark D. Stevenson, M.D., of Akron, Ohio. 5. Antipyrin Keratitis, by Professor Dr. Mitsiyasu Inouye, of Tokio, Japan. 6. The Effects of "Full" and "Minimum" Doses of Atropine Sulphate and of Homatropine Hydrobromate, by Lucien Howe, M.D., of Buffalo. To determine the refraction as accurately as is possible at a single visit the author recommends a disc containing $\frac{1}{50}$th or $\frac{1}{100}$th of a grain of atropine sulphate; to learn the condition of the accommodation a disc of $\frac{1}{2000}$th of a grain may be used; to know the refraction without regard to the accommodation about $\frac{1}{50}$th of a grain of homatropine is by far the most convenient. 7. Ophthalmic Subjects in Talmudic Literature by Aaron Brav, M.D.; this is an interesting account of old Jewish terms. 8. Monocular Visible Spasm of the Central Artery of the Retina, with a case, by D. F. Harbridge, M.D., of Philadelphia. The number contains many abstracts from foreign literature, also some reviews and the index of the second volume.

Le Liège. July, 1906. No. 1. Paris: 52, Rue Saint-Georges. Price 2 francs.—We have received for notice a copy of this new journal which is edited by Mr. Max Hilbig. The title of the journal is printed on a very thin slab of cork adhering to the paper cover. The journal contains an interesting account of the cork-oak forests of Algeria with illustrations. The advantages of cork bricks and tiles for building purposes is pointed out and it is stated that cork is so resistant that it is not attacked by the bacterium which, under the name of bacillus amylobacter, plays such an important part in the decomposition of vegetable matters. The best corks for bottles, it is stated, are always hand-cut. It is estimated that from 25 to 27 millions of francs' worth of cork are annually transformed into corks for bottles in the whole world. The corking of bottles of all kinds is a matter of importance to the medical profession and we welcome a technical journal devoted to the interests of cork.

New Inventions.

A "SCISSORS SHIELD" FOR CIRCUMCISION.

I VENTURE to bring to the notice of the profession a little instrument for performing the operation of circumcision on very young children, no anæsthetic or ligatures being required. It is, as represented in the accompanying illustration, composed of half the ordinary shield so commonly used, the place of the remaining half being taken by the right blade of the scissors. The whole can be taken to pieces for the purpose of cleansing. I am of the opinion that by its use uniformity of results can be attained. The following are the directions for operating with the "scissors shield," which name exactly describes the instrument:—



1. The prepuce to the required length is seized by the thumb and forefinger of the left hand and passed obliquely (the blades being separated) through the groove in the scissors shield, the cutting blade being above. 2. The prepuce is now cut off with one movement directed obliquely from below upwards, to avoid the vessels of the frænum. 3. The mucous lining which is now exposed over the glans is treated in a similar manner. 4. The mucous membrane is now further torn in the middle line by the fingers or cut with a scissor right down into the neck of the glans, this being the most important step of the operation. The remains of the mucous membrane is now reflected flatly and evenly downwards and held in position by a narrow slip of lint and "heft band" plaster—i.e., a piece of plaster shaped like an obtuse-angled splint. 5. In very young children anæsthetics or ligatures are not required; of course, this does not apply to older children and adults.

The instrument has been made for me by Messrs. Allen and Hanburys, also by Messrs. Krohne and Seseman.

HENRY DUTCH, M.D. Brux., M.R.C.S. Eng.

Berkeley-street, W.

A UTERINE COTTON-WOOL FORCEPS.

ALL medical men when trying to remove soiled cotton-wool from any of the different varieties of uterine probes must have noticed the difficulty which they have in doing so. For some considerable time I have been using the instrument here illustrated and have found that it easily overcomes that difficulty. I call it a uterine cotton-wool holder or forceps. By pressing the neck of the instrument the blades are separated and a piece of cotton-wool, say, two and a half inches long by two inches broad is placed between them. Then the wool is wound round the blades. To remove the soiled wool separate the blades two or three times by pressing the neck. Then take a piece of clean wool between the first finger and thumb of the left hand and push off the soiled wool. If there is any difficulty in doing so separate the blades again a few times. Messrs. Arnold and Sons of London made the instrument for me.

J. CRAWFORD ROBERTSON, M.D., C.M. Glasg.

Maryborough, Queensland, Australia.

THE LANCET.

LONDON: SATURDAY, AUGUST 25, 1906.

The Meeting of the British Medical Association at Toronto.

In 1897 the British Medical Association for the first time crossed the sea to hold its annual meeting in Canada, and now, after the lapse of nine years, it is paying a second visit to the same prosperous and important colony. In all parts of the British Empire the year 1897 was rendered memorable by the celebration of Queen VICTORIA'S Diamond Jubilee, and Canada in entertaining two of the best known British scientific associations during that summer did much to promote the feeling of imperial sympathy already evoked. For while Montreal gave a most cordial reception to the British Medical Association, Toronto no less hospitably entertained the British Association for the Advancement of Science. The British Medical Association is now the guest of Toronto, and the kind of reciprocity witnessed in such meetings affords the best possible illustration of the fellow-feeling which exists between the self-governing colonies and the mother country. Medical men cannot, as a rule, allow themselves long holidays, but the prospect of meeting their Canadian brethren, and of seeing something of the country upon which such lofty expectations are now set, has had such attractions that a journey of several thousand miles out and home has been cheerfully undertaken by many fortunate members of our profession.

English visitors are always welcome in Canada and sight-seers, who will find much to interest them, will travel under the pleasantest possible conditions. The climate is one of the healthiest in the world, the language is our own, social usages are quite similar, and money goes a long way, while for the lover of fine scenery there are natural marvels unapproached in the world for splendour and variety. The traveller in Canada will find an immense diversity of mountain and valley, river and lake, forest and prairie, uninhabited wilderness and fertile expanses covered with wheat. The vast chain of lakes with an area of 150,000 square miles, the northern primeval forests, the western Rocky Mountains, Niagara Falls, the Thousand Islands—some of all these at least he will see, and will understand why the Canadian loves his country, and why thoughtful inhabitants of the mother country see in Canadian prosperity such vast promises. The wheat-growing belts of Manitoba and the North-West, which make of Canada the granary of the empire, cover some 60,000 square miles intersected by navigable rivers, and the millions of bushels of grain produced stagger the imagination with their immensity. These are the sights which unroll themselves before the traveller's eye, while he proudly remembers that he has a birth heritage in their glories. For not less important to us than the commodities with which Canada supplies us is the fact that in her we have a vigorous and attached descendant, capable of assisting the mother-land in various ways. We have spoken of food only, but the Canadians can turn the ploughshare into the sword and take their place in the battlefield if occasion requires, as the services of the Canadian contingents in the hard-fought fields of the South African war well prove.

Canada in the course of its material progress has been throughout served well medically. The Dominion is well provided with medical schools and there are fine hospitals in the larger towns. For the population of five and a half millions distributed very unequally over the vast area of the Dominion there are medical schools in four provinces, while there is every sign that medical development will follow quickly and proportionately upon the great rise in population now justly anticipated. In the province of Quebec there are four medical schools—comprising Laval University, in the city of Quebec; and Laval University, McGill University, and Bishop's College in Montreal. The medical schools in Toronto were fully described in a series of articles which was commenced in our issue of July 28th, p. 268, and concluded last week, but there are also medical faculties of Dalhousie University at Halifax, Nova Scotia, and of the University of Manitoba at Winnipeg, Manitoba. The oldest of the Canadian medical schools is the medical faculty of McGill University, dating from about 1830, but the University of Toronto has the largest number of medical students. All these educational bodies have the power of granting degrees and all are connected with universities either directly or by affiliation. A considerable proportion of the professors and teachers are men of unquestioned eminence, the courses of study are similar to those in Great Britain with some predominance of laboratory work over formal lectures, and the standard of the examinations for graduation is high; but, nevertheless, the curious anomaly exists that Canadian degrees are not registrable in Great Britain. This state of affairs is due to the fact that in Canada there is no Dominion examining board, but each individual province has its own system of medical registration as well as the legal control of such medical schools as may be in it, an arrangement which is incompatible with the decision of the British General Medical Council not to register colonial qualifications unless granted by universities situated in autonomous provinces. A solution of this difficulty would be a triumph of medical politics and the situation will, we hope, be debated during the meeting whose sittings will have commenced before these pages reach our readers.

The British Medical Association: The Address in Medicine.

SIR JAMES BARR chose a most admirable subject for his Address in Medicine at the meeting of the British Medical Association at Toronto, when he decided to discuss the Circulation viewed from the Periphery. Whether looked at from a physiological, from a pathological, or from a clinical point of view the interest in this theme must be of the first importance, for many theoretical and experimental deductions owe their application in the actual treatment of

disease to our right appreciation of the problems discussed by Sir JAMES BARR. There is a great tendency when dealing with circulatory disorders to adopt therapeutic measures which act on the heart only; drugs are given which increase the cardiac power in order to stimulate the circulation. It is too often forgotten that the heart may be relieved in two ways—either by the administration of drugs acting as a central stimulus, or by reducing the resistance in the peripheral circulation which the heart has to overcome. The latter procedure is as important in many cases as the former, but at any rate until quite modern times it has not received the same attention. Sir JAMES BARR, who may be congratulated upon being a pioneer, points out that writers hitherto on this subject have almost invariably traced the circulation from the centre to the periphery, and it is worthy of notice that although the numerous treatises on diseases of the heart and aorta have received many annual additions with regularity, until recent years a careful study of the peripheral circulation has been largely left to physiologists—the physician's need of such information being insufficiently recognised. It was a happy thought of the lecturer to reverse the usual procedure, and it has resulted in an address of distinct originality.

Sir JAMES BARR refers to many interesting points connected with the functions and structure of the smaller arteries and veins and of the capillaries, and his lecture will serve to remind many of our readers how indefinitely the scope of systemic medicine is now enlarging. In considering the capillary circulation, he duly insists on its importance as the medium through which the interchange of nutritive pabulum and gases takes place between the blood and tissues, while he points out that the exact conditions under which this circulation is carried on have not until recently been fully comprehended; yet knowing their physiological functions we can all see that a careful study of these little tubes is of as much importance as study of the heart itself. It will probably be a new fact to many to learn that, although in very plethoric individuals and in cases of polycythæmia the capillaries of the body are fairly replete, in ordinary subjects, and especially in those of neurotic temperament, perhaps not a third of the capillaries are full at any one moment. From the fact, then, that in normal circumstances a sufficient quantity of blood cannot pass through the arterioles to keep the enormous capillary bed full the lateral pressure and the velocity in the capillaries must be ever-varying quantities. Sir JAMES BARR'S observations on these two forces require careful attention in order to appreciate them fully, but his contentions are sound and based on accurate scientific reasoning. From a clinical point of view one fact is particularly important—namely, that the pressure stands in direct relation to the freedom of the inflow and the obstruction to the outflow. To illustrate this point a simple example was taken. In cases of local syncope the lumen of the arterioles supplying the affected district is obliterated and the capillary pressure is reduced to *nil*. If measures are taken to dilate the arterioles, the mass of blood in the capillaries is augmented, the pressure rises, and the fall in the pressure gradient between the arteries and capillaries becomes more gradual. The velocity of the blood in the capillaries is also considered in a similarly graphic manner. Sir JAMES BARR shows that it depends chiefly on the potential in the arteries—the higher the arterial pressure the greater the velocity in the arterioles and capillaries. As a general rule it may be assumed that high arterial tension drives the blood through the arterioles and capillaries with great velocity. If, however, only the arterioles of a small area, such as the hand, be contracted the general arterial pressure is not affected; the blood travels in the direction of least resistance, the supply to the hand is diminished, and although the capillary pressure is lessened the velocity is not increased. The regulation of the velocity in the capillaries is a matter of considerable clinical importance. When the velocity is reduced to one millimetre or less per second the blood is surcharged with carbonic acid, the skin or organ supplied becoming of a dusky hue. If the capillary velocity be increased this appearance disappears. To give an example: in cases of cardiac failure with or without any obstructive lung disease, there is often cyanosis of the arms and upper parts of the body. In order to relieve this venous condition of the blood, and to assist in restoring the normal respiratory exchange, oxygen gas is frequently administered. Sir JAMES BARR rightly suggests, however, that the correct treatment would be a judicious cardiac tonic, that is to say, the essential requirement is the administration of drugs which increase the velocity of the capillary circulation.

Turning to another subject—the resistance offered to the arterial flow and consequently to the heart, Sir JAMES BARR discussed the views held by various investigators as to whether this resistance was due to the viscosity of the blood or whether it was situated in the arterioles or in the capillaries. We agree with him when he maintains that the barrier to the outflow from the heart exists in the small arteries and arterioles which are governed by vaso-motor action. His arguments for upholding this opinion are strong and, to our mind, convincing. The main reason he gives is that there is very little fall in the pressure-gradient from the large to the small arteries, whereas in the very small arteries and in the arterioles, where he maintains that the resistance exists, there is a very great fall in the pressure and an increased velocity. If, says Sir JAMES BARR, the capillaries formed the first line of resistance, the fall in the pressure-gradient in the arterioles would be much more gradual, and high arterial pressure would be associated with high capillary pressure. As is well known, however, the reverse is the case. We would point out that the fact of the resistance being in the arterioles must be regarded as an important clinical point. In order to relieve a dilated heart, not only must the heart itself be stimulated but drugs must be given which dilate the arterioles so as to lessen the resistance which the heart has to overcome. It is this kind of simple lesson, not dogmatic but reasoned out, for which the busy practitioner is grateful, and for many such dicta we warmly recommend Sir JAMES BARR'S address to the attention of our readers. He has added to the valuable work which has been carried out during recent years by various observers in regard to altered blood pressure, its causes and effects. Some time must elapse before the full significance of these researches can be appreciated, but this address

explains many of the phenomena occurring in connexion with the circulatory system in a manner approved by modern science and contains numerous suggestions which will be of value in correlating the clinical aspect of altered blood pressure with physiological considerations.

The British Medical Association: The Address in Surgery.

THE most interesting subject on which anyone can speak is that about which he knows most, and therefore Sir VICTOR HORSLEY acted wisely in choosing as the subject of his address at Toronto the recent progress of the surgery of the brain. Twenty years have elapsed since Sir VICTOR HORSLEY first brought forward at a meeting of the British Medical Association cases illustrating cerebral surgery, and very striking is the contrast between the state of our knowledge of the surgical aspect of this region of the body at that time and at present. As Sir VICTOR HORSLEY has for many years formed one of the main objects of attacks by antivivisectionists it is clearly nothing more than his due that it should be recognised that very much of the success which has attended the evolution of the surgery of the brain is due to his experiments on animals; in no other way could the progress have been so assured and so great than in that followed by him and the group of physiologists and pathologists associated with cerebral surgery. Even with regard to the anæsthesia for operations on the central nervous system the ultimate choice of one anæsthetic rather than another has been based on experiments on animals. In all cases it has been necessary by observations on human beings to confirm and extend the broad principles thus obtained, but without the laboratory work the difficulties would possibly have been insurmountable.

Too long has it been customary to look upon operative procedures on the brain or spinal cord as a last resource—this may be called the essential message of Sir VICTOR HORSLEY'S address. Months and even years are spent on medicinal treatment, and when those in charge of the case have to confess utter failure, then, and not till then, the surgeon is called in and asked, and expected, to accomplish miracles. What can be hoped from surgery in a case where optic neuritis has lasted for nine or even 13 years? And yet Sir VICTOR HORSLEY has been requested to operate in such cases and to remove tumours which have destroyed vision years before. All, or nearly all, the harmful results of cerebral growths are due to the pressure exerted on neighbouring structures. At first the only effect of this pressure is to interfere with the function of the part compressed, to delay or forbid the transmission of nerve currents, to prevent the due working of nerve centres, or by interference with the circulation of a portion of nerve tissue to put an end to its action. Soon, however, pressure on the nerve tissue leads to atrophy. Such a result will follow a constant pressure in any organ of the body, but it is especially rapid and certain when the compressed tissue is so complex and delicate a structure as that of the central nervous system. Every day that unnecessarily delays the removal of the pressure tends to diminish the possibility of the return of function or to limit the completeness of the recovery. Even when the pressure is of a nature removeable by medicinal means, as in the case of a syphilitic gumma, the medicinal means must be employed early and energetically if good is to result. An immense responsibility rests therefore on those who counsel unnecessary delay in resorting to surgical methods for the relief of cerebral pressure. The medicinal treatment may reasonably ask for a trial before any call is made for surgical aid, and, with the idea of getting some general line of procedure for cases which must offer many general similarities, it has been suggested that surgical interference may be postponed for three months. The delay in the opinion of many is sufficient. It cannot, on the one hand, be looked upon as too short a time, nor can it be urged, on the other hand, that the time has been unduly prolonged. But we think that when three months have run their course no excuse can be offered for further delay, and the assistance of the surgeon should be invited. It must not be imagined that in all cases so long a period should be allowed to elapse before the surgeon is called upon for assistance, for it may be recognised at a much earlier period that medicine can do no more, but where no indications of urgency exist the delay is reasonable. Sir VICTOR HORSLEY, however, feels that he may lay down a definite rule that in no case of optic neuritis (unless of toxic or anæmic origin) should the process be allowed to continue after it has once been diagnosed, for if it be left unrelieved, and blindness results therefrom, a heavy responsibility rests on anyone who failed to advise such a simple proceeding as opening the dura mater.

For operation on the brain there is little that is special in the preparation of the patient, though calcium chloride appears to be of use where much oozing is expected, as in the case of perforating tumours of the skull. As to the anæsthetic the use of morphine hypodermically in conjunction with chloroform has been abandoned, for it has been found that the morphine was harmful both from its effect on the alimentary canal and from its depressing influence on the respiratory centre. Ether is inadmissible, in spite of it being safer than chloroform, because it raises the blood pressure and increases the venosity of the blood, and this occurrence may cause much additional and troublesome hæmorrhage. Chloroform, on the other hand, causes a fall of blood pressure and so less hæmorrhage occurs. It is, however, distinctly more dangerous than ether, while all cases of increased intracranial tension are especially liable to sudden death from paralysis of the respiratory centre. It is therefore essential that some apparatus should be employed by which a definite percentage of chloroform may be given. Sir VICTOR HORSLEY always uses the Vernon-Harcourt apparatus, the merits of which are known to all our readers. A point of great importance in the administration of chloroform in these cases, or indeed of any anæsthetic, is that the depth of narcosis, and therefore the amount of anæsthetic administered, should vary with the sensitiveness of the structures about to be divided. 2 per cent. of chloroform vapour will induce anæsthesia and allow the division of the skin and the reflexion of the scalp flap, for this is the most painful part of the operation, but 1 per cent. will suffice for the removal of the bone, for bone is less

sensitive. The dura mater has a fair nerve-supply from the trigeminal, and when the dura mater is divided a slightly deeper anæsthesia is needed. That accomplished however, less than 0·5 per cent. will be amply sufficient for most operations on the brain substance, for the encephalon is for the most part little sensitive. Sometimes, indeed, the chloroform may be entirely cut off for 10 or 15 minutes, and in one case Sir VICTOR HORSLEY was able to operate for 20 minutes without chloroform on a child with a cerebellar tumour.

In all intracranial operations it is of the first importance to arrest hæmorrhage, but the oft-tried expedient of tying a main artery such as a carotid does not meet with Sir VICTOR HORSLEY'S approval. For the capillary and arteriole oozing he finds nothing better than hot irrigation, and for this purpose the temperature of the lotion should not be allowed to fall below 110° F., while it should not exceed 115°. Another expedient of value in the arrest of venous and capillary oozing is the inhalation of oxygen, for this lowers immediately the pressure in the veins, the bleeding ceasing rapidly as the dark purple of the oozing blood changes to bright scarlet. Much of the danger from shock in these operations can be avoided by dividing the operation into two stages with an interval of some five days; for it is certain that it is the opening of the skull which causes most shock by producing general depression of nerve energy and alteration in the circulation. If we may judge by statistics, the danger in these operations varies greatly with the region involved, most deaths occurring when the cerebellar region is dealt with and least when the motor area is affected. It is, moreover, clear that in operations designed to remove an excess of intracranial tension shock is least fatal when, a correct diagnosis having been made, the skull has been opened immediately over the affected part, and the tumour has been easily removed. Conversely when an incorrect diagnosis has been made and the skull has been opened at a distance from the tumour, which was therefore not removed, a much higher rate of mortality has occurred.

Of the danger of sepsis in operations on the contents of the skull no difference of opinion can exist, but especial precautions should be taken in these cases, and Sir VICTOR HORSLEY points out that a weak antiseptic lotion is desirable for the irrigation fluid; that the subsequent dressing should be antiseptic (some mercurial salt being employed) and not merely aseptic; and lastly, that drainage should be employed as little as possible, for every drain forms a probable channel for the admission of germs. It is important to displace as slightly as possible the cerebral tissues, for even if they have not been visibly damaged permanent harm appears to result from displacing portions of the brain; and all pressure exerted on brain substance, as in raising the frontal lobe, must be of the utmost gentleness and applied slowly. It has been suggested that a lateral lobe of the cerebellum may be removed without danger for the purpose of reaching deeply seated tumours and so far as experience goes very little harm seems to result, but it is an unnecessary mutilation and should therefore be avoided, even though we are unable to trace to it any harmful results. Finally, in many cases it appears to be sufficient for removing the effects of pressure to open the skull, though it is generally necessary to divide the dura mater also, and this may be effective in relieving symptoms even though it may not be possible to remove the tumour causing the increased pressure. In several cases Sir VICTOR HORSLEY has laid bare gliomata and having found them inoperable he has closed the wound. From the date of the operation the symptoms have steadily diminished and ultimately disappeared. Without venturing to suggest any adequate explanation of the facts, it cannot be doubted that complete or almost complete recovery does follow in many of these cases.

The conclusions to be drawn are that in the last 20 years great progress has been made in this the youngest, or almost the youngest, branch of surgery; we have learned to avoid or to counteract many of the dangers which beset the path of the operator on the brain and the field of utility has been widely extended. Much has, indeed, been done, much still remains to do, and as in the past no small share of the achievements already gained are due to Sir VICTOR HORSLEY, so in the future we may with confidence expect that he will be one of our forerunners along this most difficult yet most encouraging branch of surgery.

Annotations.

"Ne quid nimis."

GOATS' MILK FOR INFANTS.

IN a letter which appears in our correspondence columns this week an interesting point is raised by the writer in regard to the suitability of goats' milk for infant feeding. There is evidently a wide diversity of opinion on this question judging from the totally opposite views taken by different authorities on dietetics in general. One writer, indeed, on one page of his book regards goats' milk with favour in infant feeding, while on another page he refers to its indigestibility. Thus, he says, "it [i.e., goats' milk] is the most highly nutritious of these milks but it is the least digestible." In the same book it is written in another place: "The reason why the milk of the ass and even that of the goat will agree with the human infant when cow's milk disagrees would appear to be owing to their different manner of clotting when they come into contact with the gastric juice. Cow's milk has a tendency to coagulate in the infant's stomach into large, firm, cheese-like masses which are apt to cause much gastro-intestinal irritation, whereas ass's and goat's milk form a loose flocculent curd like human milk." Another authority writes: "Goats' milk is a strong milk, stronger even than cows', and in no way suited for use in infancy," and another that "the coagulation [of goats' milk] obtained by acid or rennet is more solid and is harder than that from cow's milk." As to the chemical composition of goats' milk in its relation to human or cows' milk there ought not to be, of course, two opinions and yet one authority writes, "The milk of the goat, as a rule, contains more cream than that of the cow and rather less albuminous matter," while another says, "goats' milk is richer in albuminates and fats than human milk and even than cows' milk." The latter writer is correct judging from the average figures given in a number of analyses by various authoritative observers. The composition of a milk would appear to depend upon the rate of growth of the animal for which it is intended, and the variations occur chiefly in regard to the proteids and mineral constituents. Heubner, for instance, showed that as the proportion together of proteid and mineral matter increased in milk, so the time taken to double the weight of the animal was diminished.

Thus the milk of the rabbit contains 10·4 per cent. of proteid and 2·4 per cent. of ash and the weight of the baby rabbit is doubled in about seven days. The human animal is at the other end of the scale, for human milk shows only 1·0 per cent. of proteid and 0·2 per cent. of mineral matter, and accordingly the human baby's weight takes as many as 180 days to double. The kid's weight is doubled in 19 days and goats' milk contains 4·3 per cent. of proteid and 0·8 per cent. of mineral matter. There can be no excuse for mis-stating the composition of goats' milk as appears to have been done in the case quoted by our correspondent, and it is certainly a misrepresentation of fact to state (if it was so stated) that "goats' milk was worse than skimmed milk and did not contain sufficient fat or sugar." As a matter of fact, goats' milk is richer in proteids and mineral salts than genuine cows' milk and contains usually as much sugar and rather more fat. Goats' milk therefore as a substitute for cows' milk or human milk cannot be condemned on the grounds of its chemical composition, but its adaptability for the human infant's needs is another matter.

FLY LIFE AND INFECTIVE DISEASE.

THE fly, like the worm, has its place and function in the economy of nature both for good and for evil. What the worm is to the soil the fly is to the air, exercising a depurative influence by its absorption of effluvia which, directly inhaled, would be mischievous, even fatal, to man. On the other hand, the fly may be the carrier and transmitter of pathogenic organisms which, introduced by puncture or even simple contact into the human subject, are the proximate cause of infective disease. In 1888 Professor Angelo Celli of Rome observed that flies nourished on the typhoid bacillus transmit, by the medium of their fæces, the same malady in all its virulence—an observation amply confirmed just ten years later, in 1898, in the American concentration camps in Cuba during the war. Even prior to this a similar observation, experimentally confirmed, had been made in Hamburg in the case of cholera. Flies, during the necropsy of a victim to that disease, having alighted on the intestine, were inclosed in a glass receptacle so that the air and the movement might desiccate and neutralise the particles of choleraic virus adhering to their wings and extremities, and were thereafter placed in a tube containing liquid gelatine. In 48 hours all the plaques were covered with colonies of the bacillus virgula. More recently, in Paris, it was shown that flies are the principal agents in diffusing cholera at short distances, thus explaining the fact that cholera epidemics diminish in intensity during winter when fly life is arrested by the cold. A still more recent study in this field is that of Professor Saverio Santori of the bacteriological laboratory of the Roman commune, by which he demonstrates the fly as causing the dissemination of "infective intestinal maladies," particularly the summer gastro-enteritis of children in its acute form. Examining the statistics of the Italian death-rate, he found that while in the last 20 years well-nigh all infective diseases are on the wane some, and these the intestinal, show little or no tendency to decrease. Inferring that these ailments must be propagated by other than the usual agents, against which we neglect to guard ourselves, Professor Santori bethought him of the flies. He thereupon made a study of the "flora bacterica" contained in their digestive tube, on the tracks they left on the places over which they crawled, and on all their corporeal superficies, taking special care that the said flies came from the most frequented localities, especially from the neighbourhood of market places and hospitals. The results were surprising even to himself. He found that on the walking apparatus, the wings, the proboscides, and, in general, all over the bodies of the flies there were pathogenic bacilli not only in vast quantities but of the most varied forms, the latter observation seeming natural enough when we think of the infinity of soiled substances upon which the fly alights. At the same time, this variety of form in the bacilli was much less in the digestive tube, one form so preponderating as to make all the others practically non-existent. Professor Santori, in fact, from cultures derived from flies frequenting a Roman market place succeeded in isolating a bacillus which under the microscope appeared mobile, short and stunted, its characteristics, morphological, cultural, and biological, and its pathological features corresponding exactly to that "speciale micro-organismo" which Dr. G. Volpino described some months ago in the "Archivio per le Scienze Mediche" as the "pathogenic agent" of the "infezioni viscerali" affecting infants in summer. The importance of this identification is manifest. It may explain the enormous diffusion of this gastro-intestinal malady, particularly in the summer, and it also throws light on the fact that in these later years the malady, unlike other infective diseases, shows little or no signs of decrease. The practical, hygienic, corollary thence arising is, according to Professor Santori, to take special measures for lessening in our habitations the excessive number of flies and for the prompt and thorough removal of the soiled or putrescent substances from which these flies transport and diffuse, in myriads, the pathogenic germs.

ŒSOPHAGEAL SYMPTOMS IN AORTIC ANEURYSM.

AT a meeting of the Société Médicale des Hôpitaux of Paris held on May 4th M. Edgard Hirtz and M. Henri Lemaire reported an important case of aortic aneurysm with œsophageal symptoms. Rupture of an aortic aneurysm into the digestive tract is rare. In a period of 72 years 142 cases of ruptured aneurysm were reported to the Société Anatomique of Paris. In 79 of these rupture occurred into the air passages and in only six into the digestive tract, once into the duodenum, once into the stomach, and four times into the œsophagus. A man, aged 55 years, was admitted into hospital on March 3rd, 1905. It could not be ascertained whether he had had syphilis or not. For six months he had suffered from digestive troubles. At the beginning there was a little diarrhœa, but in the last few weeks this had given place to constipation. For two months vomiting had followed nearly every meal. At first the vomiting occurred about an hour after meals, then it occurred earlier, and finally it took the form of regurgitation. After taking a few mouthfuls of food the patient had to get up in order to eject what he had swallowed. This always occurred in the case of liquids but solids were often retained. Deglutition was not painful and did not appear to be difficult. For four months the patient had been losing flesh and strength. On admission he looked cachectic and the conjunctivæ and face had a sub-icteric tinge. There was myosis without inequality of pupils. In the upper part of the epigastrium some deep and painful lumps were felt. On taking a glass of milk the patient vomited it after some seconds and in the meantime abundant salivation occurred. The urine was increased in quantity and contained a trace of albumin. The area of cardiac dulness was increased, especially to the left. The apex beat was in the fifth space outside the nipple line. Auscultation showed a "*bruit de galop*" on the left side and a resounding second sound at the base. The arteries were atheromatous; the radial and femoral pulses were equal. Abundant salivation always followed the taking of food but occurred at no other time. The patient complained of great thirst which he could not quench. The existence of painless œsophageal vomiting with abundant salivation led to the

diagnosis of stricture of the œsophagus. The lumps felt in the epigastrium seemed to point to malignant disease of the cardia. But the regurgitation followed closer and closer upon deglutition and the patient was not compelled to diminish more and more the size of the bolus; moreover, the regurgitation was almost selective for liquids. These facts were not in accord with the existence of a progressive malignant stricture of the lower end of the œsophagus. The hypothesis of pressure on the œsophagus by a mediastinal tumour was also entertained. On March 8th there was a severe attack of hæmatemesis; bright red blood was ejected without any effort of vomiting. Syncope followed and about an hour later a stool consisting of black clot was passed. On the following day a similar attack of hæmatemesis occurred and proved fatal. The necropsy showed a greatly enlarged heart and induration and insufficiency of the aortic valves. The aorta was uniformly dilated from the arch to just above the diaphragm, its diameter being more than five centimetres. At the diaphragm was a spherical aneurysm of the size of the fist. It was intimately adherent to the œsophagus, into which it had perforated. The lumen of the œsophagus was but little contracted by the aneurysm. The left pneumogastric nerve was involved in the adhesions between the œsophagus and the aneurysm and was exposed in the communication between them. It is noteworthy that the only symptoms of the aneurysm before rupture were the "œsophageal vomiting" (regurgitation) and the salivation after taking food. M. Hirtz and M. Lemaire thought that the latter was an œsophago-salivary reflex. M. Antony has pointed out the existence of this reflex in cancer of the œsophagus. The survival of the patient after the rupture of the aneurysm (indicated by the first attack of hæmatemesis) is also noteworthy. So, too, are the facts that there was no mechanical obstacle to deglutition and that liquids were not so well swallowed as solids. Dysphagia is rare in aortic aneurysm. In this case both the salivation and the vomiting appeared to be reflex effects of irritation of the exposed pneumogastric nerve during deglutition. Spasm of the œsophagus was excited and was the obstacle to deglutition. This explains the selective character of the vomiting.

KISSING THE BOOK.

THE question of the possibility of infection by the kissing of the dirty copy of the Gospels in the English form of taking the oath in court or elsewhere has again been the subject of much correspondence in the daily press. Our own columns have for years borne witness to the unpleasantness and to the risk of infection which the kissing of a book which has been kissed by several hundreds of other people entails, and we have again and again drawn attention to the provision of the Oaths Act of 1888, of which Section 5 runs as follows:—

> If any person to whom an oath is administered desires to swear with uplifted hand in the form and manner in which an oath is usually administered in Scotland he shall be permitted to do so and the oath shall be administered to him in such a form and manner without further question.

Apparently, however, certain officials are still ignorant of, or desire to ignore, the provisions of this Act. Thus a correspondent, writing in the *Times* of August 17th, says that he recently attempted to be sworn in the Scottish fashion before a London county court judge, but that the judge showed much reluctance to accept the oath and he, the correspondent, therefore did not press the point. About 11 years ago his honour Judge Emden placed notices in his court drawing attention to the fact that any person who had to be sworn might be so sworn in the Scottish fashion, and it was recently announced that the chief clerk of the Lambeth police court had given instructions that all witnesses are for the future to be given the option of being sworn in the Scottish fashion. Every British subject is supposed to be acquainted with the laws of his country, so, legally speaking, a person has only himself to blame who does not avail himself of the provisions of the Act of 1888; but it is difficult for the ordinary person to go against the apparent wish of a judge or of a magistrate that the Scottish form should not be employed. We think it would be well that all persons exercising judicial functions, if they do not feel themselves bound to go so far as to give witnesses, without their demanding it, the option of being sworn in the Scottish fashion, should at least exhibit a notice in their courts on the model of that adopted by Judge Emden.

A QUACK SENT TO PRISON.

Abraham Levine, described as a tailor, was sentenced at the recent County of London Sessions to 15 months' hard labour for an assault upon an epileptic girl whom he had undertaken to cure. Evidence was given that he had for some time made money by pretending to treat disease, particularly epilepsy, and also that he had obtained £2 from a woman by promising to bring back her husband who had deserted her. He was certified for deportation at the expiration of his sentence. Apparently if Levine had not taken advantage of the opportunity afforded to him by a helpless girl being placed in his power by her mother in order to assault her he would have continued to make a wholly dishonest livelihood undisturbed. He possessed no medical qualifications, but so long as he made no pretence of being a registered medical practitioner he might claim to be able to cure any disease, might extract money, and might endanger the lives of his dupes to an extent upon which the law imposed no limits.

HÆMATOGENOUS ALBUMINURIA.

MANY observers have recorded the fact observed in soldiers, cadets, children, and others, who were apparently healthy, that albumin is occasionally found in the urine. The same difficulty is sometimes experienced in examinations for life insurance. A young man applies for insurance. On examination everything is found to be satisfactory except that a trace of albumin is discovered in the urine. The urine is not continuously of low specific gravity and the albumin (serum albumin) is often present only at intervals following the rise from bed or succeeding a meal. Or it comes on after muscular exertion, cold bathing, or emotional strain. The late Sir Andrew Clark stated that he frequently found albuminuria in young men who had been working hard for their examinations. This condition is the subject of a paper in this issue of THE LANCET, by Dr. R. Hingston Fox, under the title of "Hæmatogenous Albuminuria." He refers to the researches of Sir A. E. Wright, who has produced strong grounds for the belief that this form of albuminuria is due to a disorder of the blood, the outstanding feature of which is lessened coagulability. Dr. Fox makes some interesting observations on the control of the albumin by the use of calcium lactate. This is an important point which is not generally recognised. Dr. Fox used the test in 16 cases of albuminuria indiscriminately. In seven the albumin disappeared or was reduced to a small trace after the taking of the lactate. Dr. Fox believes that these were all instances of hæmatogenous albuminuria. In the remaining nine the albumin persisted; in most of these cases signs of kidney disease were present. Notes of the cases are given by Dr. Fox and for details we refer our readers to the original paper. This clinical test is of considerable importance, and if the observations can be further corroborated a valuable aid will be offered to diagnosis. This form of transient albuminuria is not immediately of serious import, but its presence is always embarrassing to the

physician who has to forecast chances of life, and so on. The question of ultimate prognosis is a difficult one, and as Dr. Fox remarks, many years' experience will be needful in order to decide with certainty whether these cases eventually become the subject of progressive disease. The responsibilities of examiners for life insurance in this matter are considerable.

KING EDWARD VII. SANATORIUM.

THE King Edward VII. Sanatorium, which has now been open some two months, is, we are glad to know, in satisfactory working order, as many suitable cases being under charge as has been thought prudent to commence with. But there appears to be some doubt both among the members of the medical profession and of the general public as to the class of cases eligible for admission to this institution. We are requested to state that by the wish of His Majesty the King the sanatorium is primarily intended for the accommodation of those persons of slender means among the educated classes who are suffering from early pulmonary tuberculosis, and who are unable to pay the charges of private sanatoriums. For such patients 86 beds are reserved at a charge of two guineas per week, both sexes being admitted in equal numbers. It is also the King's wish that those persons of larger means who can afford to pay for treatment should not be entirely excluded from the advantages to be derived from the institution, and 14 beds have accordingly been reserved for them, for which a charge of eight guineas a week is made.

COEXISTENCE OF DISEASES.

WE have been asked by an Australian correspondent whether any especial effect is produced on patients suffering from malignant disease or tuberculosis by the specific infectious diseases, such as typhoid fever, measles, and small-pox. Patients the subject of malignant disease are usually at an age when acute specific fevers are uncommon and we are not aware that any statistics on the subject exist. As a matter of interest, however, we may refer to the supposed effect of erysipelas on sarcoma. Cases have been recorded in which a patient suffering from sarcoma has been attacked with erysipelas, with the result that the tumour disappeared. Such instances are extremely rare and may perhaps be attributed to mere coincidence. Nevertheless, observers were led to attempt to treat sarcoma by injections of the products of the pathogenic organism of erysipelas. Coley used a fluid containing the combined toxins of the streptococcus, of the bacillus erysipelatis, and of the micrococcus prodigiosus. Fehleisen also tried the inoculation of erysipelas. The effect of both these forms of treatment seemed to produce a local and not a general modification. The result of an infectious disease occurring in a tuberculous subject does not essentially differ from that found when a healthy subject is attacked, except that in the former the powers of resistance are less and not infrequently an intercurrent affection is so badly borne as to threaten seriously the patient's life. Particularly is this the case when a patient suffering from pulmonary tuberculosis becomes infected with influenza or pneumonia. That two or more infectious diseases may coexist in the same individual is generally recognised, and clinical experience would tend to show that the presence of one disease in the body increases the liability to the infection of another. We are not aware, however, that tuberculous subjects are more susceptible to infectious diseases than are healthy people. In this connexion Dr. F. F. Caiger's statistics[1] in regard to various infectious fevers attacking patients already suffering from scarlet fever are interesting, but, as he himself states, cannot be taken as an accurate expression of the proportionate liability to coexistence. The diseases most frequently complicating scarlet fever are diphtheria, chicken-pox, and measles, but care must be taken not to confuse the exudation frequently seen in the throat in scarlet fever with diphtheritic membrane. The subject of mixed infections is an interesting one and merits more attention than has hitherto been accorded to it.

[1] System of Medicine, edited by Professor Clifford Allbutt, vol. ii., p. 286.

A BAD CASE OF OVERLYING.

AT a recent inquest at Bermondsey on the body of a child 12 days old the following story was told. Ten days after the child's birth the parents celebrated the event by holding a "sing-song," at which they both got drunk. On the following morning, or on the morning after that, a neighbour heard children crying and going into the room found the parents in a drunken sleep with the infant and three other children in the bed with them. The neighbour released one of the children upon whom the mother was lying and left. Later she heard that when the parents had roused themselves from their drunken sleep they had found the infant dead. The jury in this case returned a verdict of accidental death and requested the coroner to censure the parents. That they were greatly impressed by the coroner's censure or deeply grieved by the loss of their child seems improbable. They are rid of the responsibility and expense of bringing up their offspring, and in the course of the year other fathers and mothers will act as they did—get drunk and smother a baby—with no further result than having to attend an inquest and listen to a reproof administered by the coroner. With all respect for what may be done by instruction and admonition it will occur to many that the indictment of a few such parents for manslaughter, with a stiff sentence of imprisonment upon conviction, might bring about the saving of lives. It is difficult to believe that facts such as those mentioned above do not constitute the crime of manslaughter or that a jury before whom they were proved would refuse to find a verdict of guilty from any sympathy with the accused.

RUPTURE OF THE SPLEEN IN A CASE OF STRYCHNINE POISONING IN A MALARIAL SUBJECT.

IN the *Archives Générales de Médecine* of August 7th Dr. Poirson has reported the case of a woman who was given during an attack of malarial fever about half a gramme of a powder supposed to be quinine. About three-quarters of an hour later she called for help and was found in a state of convulsions with opisthotonos. About one and a quarter hours after taking the powder she died in a state of syncope. She was not under medical observation at any period of the attack. The necropsy showed an enlarged liver which extended four fingers' breadth below the ribs. The peritoneal cavity contained two litres of dark blood. The spleen was about thrice its normal size, very soft, and engorged with blood. There was no perisplenitis or adhesions. At the lower end of the internal border of the spleen was a rupture six centimetres long, of cuneiform shape, and covered with adherent clot. Seven centigrammes of sulphate of strychnine were extracted from the viscera. Death was evidently due to syncope, the result of hæmorrhage from the ruptured spleen and occurred before the poison had time to prove fatal. Spontaneous rupture of the spleen is a well-recognised, though rare, occurrence in malarial fever. In all the cases, as in the present instance, the spleen presented pathological changes, such as hypertrophy, softening, congestion, and friability. With the spleen in such condition an

effort or an attack of coughing would produce contraction of the abdominal muscles and pressure on the organ sufficient to cause rupture. Rupture of an apparently normal spleen as a result of muscular contraction has been recorded. Plainchant has reported the case of a woman, not suffering from malarial fever, who died during an attack of epilepsy.[1] At the necropsy a rent was found in the fissure of the spleen and there were 250 grammes of blood in the cavity of the pelvis. If convulsions can cause rupture of an apparently normal spleen they could much more easily produce rupture of the malarial spleen. When the violent character of the convulsions produced by strychnine is considered the possibility of their causing rupture of the spleen is evident. In the present case there seems to be no doubt that they were the cause of the rupture.

A PUBLIC SLAUGHTER-HOUSE FOR THE CITY OF LONDON.

WE congratulate the Cattle Markets Committee of the Court of Common Council upon its report recommending the abolition of the private slaughter-houses attached to the Metropolitan Cattle Market and the construction in their stead of a public slaughter-house. In view of the present agitation on this subject we are not surprised at the favourable reception given to this report, and there is every reason to anticipate that the City will endeavour to be the first among the many metropolitan governing bodies to create a public abattoir. So far so good. Unfortunately the report printed, and the plan of the proposed slaughter-house which accompanies this document, give so few details that it is impossible to form an opinion as to the plan of construction recommended. It is briefly stated that the public slaughter-house for cattle and sheep will be divided into ten chambers, measuring 25 feet by 26 feet, and it is stated that "this system will enable a separate chamber to be allocated to existing tenants whose trade would appear to justify exclusive accommodation and who would be prepared to pay a 'head charge' on the animals slaughtered, with a guarantee of a minimum number per annum to be paid for. One or more chambers would be reserved for public slaughtering, the whole building being under the control of the official staff." The above proposal still bears the stamp of old errors and conceptions which we must endeavour to obliterate. It would be better to make one large hall instead of ten chambers. There is no need of exclusive accommodation unless it be to practise those tricks of trade which it is so necessary to prevent. It is all very well to say that the official staff will be in control, but how can the members of the staff see through the ten partition walls of the ten chambers? We are pleased to notice on the plan that there is a separate building with a destructor for diseased meat, but no mention is made of a separate building for the preparing of tripe and the cleaning out of intestines, yet these things represent one of the most difficult parts of the problem. But we welcome with pleasure the broad fact that the principle of a municipal slaughter-house is accepted, and that the necessity of abolishing private slaughter-houses is recognised.

MALARIA IN THE FEDERATED MALAY STATES.

IN various districts where malarial fever has caused much loss of life successful results have been obtained by the adoption of modern sanitary measures based on Major R Ross's plan for the destruction of mosquitoes. In THE LANCET of May 14th, 1904, p. 1372, we drew attention to the vast improvement that had been brought about in Ismailia, Egypt. Writing in the *Times* of August 7th of this year, Dr. Hamilton Wright gives a brief account of the measures adopted at Port Swettenham in the Federated Malay States. This port was designed by the Government of these States to replace that of Klang on the upper tidal reach of the river of the same name. Port Swettenham was jungle-covered, flooded daily by tides, and incident to an average of about 100 inches of rainfall a year. Dr. Wright had shown that the district was a pest-centre of the worst forms of malaria. On the formal opening of the port Klang was abandoned and the river closed to sea-going vessels. Severe malaria immediately broke out amongst the officials and coolies employed on the railway and shipping. A commission was at once appointed, composed of medical men and railway and works officials, and was instructed to devise measures for the suppression of malaria and for the general sanitary improvement of the port. The recommendations of the commission involved an outlay of from £10,000 to £12,000. It is to the great credit of the Government that without any hesitation it accepted these recommendations. The new port was dyked, drained, levelled, and cleared. Since these sanitary measures were initiated there has been scarcely a case of malaria at the port, and from being an unhealthy, shunned swamp the port is now sought by officials as a desirable billet. We cordially support Dr. Wright when he says that such results as this, and as those achieved at Ismailia, ought to be compelling examples to those who still doubt the findings of science in regard to malaria and other tropical diseases. Major Ross, Sir Patrick Manson, and others have been pioneers in the "antimalarial campaign," and if their efforts are supported by the Governments and local authorities in those districts in which malaria is prevalent the saving of human life and the advancement of commerce will follow.

STERILE CASEOUS MATTER IN THE TREATMENT OF TUBERCULOUS DISEASE.

IN this issue we publish a "preliminary paper" by Dr. P. Paterson on the effect produced on tuberculous lesions by the injection of some of the products of the tubercle bacillus as elaborated in the body. Numerous attempts have been made by competent investigators to separate the antitoxin of tuberculosis or to obtain from cultures of the pathogenic bacillus in a direct or an indirect manner a substance which will cure the disease in the human subject. Hitherto, unfortunately, these efforts have not met with generally recognised success. There is every reason to hope, however, that eventually the much-wished-for result will be accomplished. Dr. Paterson in his investigations starts from the fact that tubercle bacilli can easily be found in the walls of tuberculous abscesses but not in the contents. The organisms may be so few that inoculation experiments may be necessary to demonstrate their presence. As the conditions in the interior of such abscesses are apparently favourable to growth, and yet the bacilli do not increase but actually diminish in numbers, Dr. Paterson argues that there must be some substance in the contents which is inimical to the bacilli; and he further suggests that as the fluids are being constantly renewed presumably this deleterious material is in the encapsulated solids. These deductions are certainly well founded and Dr. Paterson has acted energetically on them. He experienced difficulty in finding a satisfactory process by which the chemical constitution of the solids should be as little changed as possible and yet the living bacilli present be destroyed, but eventually cold applied intermittently appeared to produce the desired result. He proved that if tuberculous pus be kept in a refrigerator for five or six months, but allowed to thaw frequently during that time, the pus would not induce tuberculosis when injected into guinea-pigs. The serum from the pus was then drawn off and the sediment carefully washed so as to remove

[1] Archives Générales de Médecine, 4 série, tome xvi., p. 504, 1848.

all soluble toxins. Sterile normal salt solution was added to the sediment in certain proportions. It was this "suspension" that Dr. Paterson employed first in animals and then in patients, in order to test its therapeutic effects. He gives a short account of five cases in which he tried it, and the results are encouraging. He wisely does not claim more than this. The number of cases is far too small to justify any positive conclusion, and sufficient time must elapse to afford opportunities of observing the subsequent progress of the patients. It may be noted that the majority of Dr. Paterson's cases consisted of those forms of tuberculosis which usually come under the notice of the surgeon. We agree with him that his results fully justify further investigation.

HOSPITAL ABUSE AND SUBSCRIBERS' LETTERS.

THE system of issuing letters of recommendation to the subscribers to a hospital and admitting for treatment only patients whom they recommend has been weighed in the balance and pretty generally found wanting. Few, if any, of our London general hospitals carry out the method with any approach to strictness, and even at the special institutions there are signs that the day of such letters is passing. In truth, as generally worked the system is indefensible. Yet if it were carried out ideally it would possess at least one merit as a check on abuse of the charities concerned by those able to pay for medical attendance. In a letter to the *Daily Mail* the Rev. Richard Free, vicar of St. Clement's, Fulham, suggests that no applicant ought to receive a hospital letter unless he bring a recommendation from the medical man who has been attending him, or has at least given notice to his medical man that he intends applying for hospital treatment. The suggestion is certainly reasonable, though it does not apply to any applicant who has not already received medical attendance. Especially desirable is it that those who have letters to distribute should make inquiries as to the circumstances of applicants and their ability to pay for treatment at home. But we fear that there is little hope of any radical alteration in the habits of subscribers to hospitals, the vast majority of whom clearly think that when they have paid their subscription and received their letters they are called upon to take no further trouble as almoners of their own charity. Consequently, as there is little chance of the letter system being mended, we can only hope that it may be ended soon at all hospitals and replaced by some other arrangement which will supply the safeguards against abuse which are so clearly necessary.

NEOFORMANS VACCINE FOR MALIGNANT GROWTHS.

THE latest phase in the treatment of malignant growths is the employment of neoformans vaccine. Doyen of Paris some time ago described a micrococcus neoformans in new growths, especially in malignant new growths. He also employed a serum prepared from this micrococcus for the treatment of carcinomata, but although he himself claimed to have obtained some improvement from its use in certain cases others who followed his method of using the serum were unable to endorse his claims. A few months ago we published in THE LANCET[1] an account, by Dr. C. Jacobs and Dr. Victor Geets of Brussels, of the employment of a vaccine prepared also from the micrococcus neoformans, and cases were detailed in some of which marked improvement had occurred. In the June number of the *Journal of Laryngology, Rhinology, and Otology* appeared an account of a very interesting case under the care of Dr. R. H. Scanes Spicer at St. Mary's Hospital, in which a vaccine of the micrococcus neoformans was employed in the treatment of an inoperable carcinoma of the tongue and pharynx. Sir A. E. Wright directed the use of the vaccine and contributed a note on the method of treatment. The patient was a man, aged 75 years, and he was affected with a tumour of the left tonsil, the pillars of the fauces, the side of the tongue, and part of the pharynx. Large doses of potassium iodide had no effect and it was agreed by all who saw the case that it was malignant, and this diagnosis was confirmed by the microscope, for histologically the growth was found to be a spheroidal-celled carcinoma. A vaccine prepared from the micrococcus neoformans was then employed. The injections were controlled by estimations of the opsonic reaction of the blood. Improvement commenced at once, the mass visible in the fauces greatly diminished, the ulcerated surface lessened in extent, fœtor ceased, and pain and dysphagia disappeared. Most of the enlarged cervical glands subsided but one small hard gland remained. The total improvement was marvellous, not only in the local condition but also in the patient's general health. No other treatment was employed. The result was in no way claimed as a cure, but as very definite improvement followed the treatment it is at least worthy of an extended trial. The treatment has been employed by Sir A. E. Wright in four other cases; of these two have died, one is quite stationary, and the other shows marked signs of improvement. The micrococcus neoformans can certainly be obtained from a large number of tumours, and as a vaccine prepared from it appears to have a definite action on malignant growths we are justified in thinking that the micrococcus neoformans is at least one factor in the production of tumours. The micrococcus neoformans resembles closely a staphylococcus, but it differs from the latter in several respects. It gives at first very sparing cultures on agar, it grows in short bifurcating chains, it is agglutinated by normal human serum, even when this has been diluted 200 times, and lastly, a blood possessing a high opsonic power with respect to the micrococcus neoformans may possess a low opsonic index with respect to the staphylococcus.

[1] THE LANCET, April 7th, 1906, p. 964.

THE TRANSMISSIBILITY OF TUBERCULOSIS BY CASEIN IN PREPARED MILK FOODS.

THE researches of Dr. Calmette, demonstrating the virulence of milk of tuberculous origin even after boiling or sterilisation, have led M. Marcel Guédras to investigate the dried milk foods of commerce in order to ascertain whether they also are capable of transmitting tuberculosis, and his results are recorded in the *Comptes Rendus* of June 25th. M. Guédras took a quantity of milk from an infected source and subjected it to the ordinary industrial method of treatment for the production of casein. The milk was first passed through a centrifugal separator, the casein was precipitated by an acid, redissolved in alkali, again precipitated, and lastly desiccated at a low temperature. Guinea pigs fed with a solution of casein prepared in this way succumbed in 37 or 38 days, a similar result to that obtained by Dr. Calmette with sterilised tuberculous milk. It is clear therefore that the tubercle bacilli survive the various manipulations which the milk and casein undergo. It is well that the attention of hygienists should be called to the danger that may lurk in the ordinary dried milk foods of commerce. They are largely used by invalids and children on account of their high nutritive value, due chiefly to casein, but the fact that the processes through which they have passed do not destroy any tubercle bacilli that may be present renders it desirable that special care should be taken in employing only the milk of healthy cows. As regards the method of preparation, it is generally considered that the low temperature method of desiccation yields a product more nearly resembling the

original casein than it is possible to produce by the employment of high temperatures.

THE meeting of the British Medical Association was formally opened in the Convocation Hall of the University of Toronto on Tuesday, August 21st, under the presidency of Dr. R. A. Reeve, dean of the Faculty of Medicine in the University.

MEDICINE AND THE LAW.

Application for Order for Inquisition in Lunacy.

RECENT events have made it necessary for medical men to appreciate the details of application for inquisitions in lunacy. Section 90 of the Lunacy Act, 1890, provides that the judge in lunacy may upon application by order direct an inquisition whether a person is of unsound mind and incapable of managing himself and his affairs. The petition should be supported by affidavits by medical men—preferably unconnected with lunatic asylums—and by members of the family of the alleged lunatic, and other persons who know him, not merely stating that the respondent is of unsound mind, or setting forth in general terms the facts on which the deponent relies, but giving the precise facts and evidence. It is unnecessary and undesirable that an affidavit in support of a petition should be a very lengthy document, but the deponent should state all the material facts on which his inference of unsoundness of mind is based, and should see that the facts which he does state point to unsoundness of mind and incapacity on the part of the alleged lunatic to manage himself and his affairs. The petition for an order for an inquisition ought generally to be preferred by the nearest relative of the alleged lunatic, and if it is not so preferred the court looks at it with peculiar jealousy, for the fact implies that the persons who ought to protect him are neglecting their duty. On the other hand, no rule has been laid down to discourage proper applications from any quarter, since persons of unsound mind may require protection quite as much against their relatives as against those who do not belong to that class. Thus a commission may issue upon an information by the Attorney-General, by an executor under a will against a legatee under the same will, by a trustee under a deed against his *cestui que trust*, by a tenant of the supposed lunatic, where there was no doubt that the party was in a state that made him the proper subject of the commission (this was done in a case where action was opposed by the subject's mother, under whose care he was residing, while it was alleged that the tenant, being in arrear for rent, was taking the step with a view to gaining time); by a creditor against his debtor; and even by an absolute stranger. Where the alleged lunatic is within the jurisdiction no order is to be made upon any petition until after the expiration of seven clear days from service upon the alleged lunatic of notice of the petition. An inquisition may be ordered when either the person or the property of an alleged lunatic, whether a subject or an alien, and whether of full age or not, is within the jurisdiction. A commission in lunacy may issue against an infant, but as the Chancery Division has power over infant wards of court and their estates such a proceeding will be generally unnecessary, except in particular circumstances when the more ample powers given in lunacy may be required for managing their estates.

A commission may also issue against a subject (1) resident out of, but possessing property in, England, and (2) possessing property out of, but resident in, England. In *Ex parte Southcot* (2 Ves. sen. 401) Lord Hardwicke, after a full examination of the principles and practice applicable to the subject, made an order for a commission against an alleged lunatic resident in Flanders but possessing property in England, directing the inquiry to be held where the mansion and the greater part of the estate lay. This precedent has been repeatedly followed. Under the Rules in Lunacy, 1893, r. 1, an inquisition may be ordered in the case of persons incapable by mental infirmity, arising from disease or age, of managing their affairs. An action will lie for maliciously suing out a commission in lunacy against a person, but to support such an action malice or a want of probable cause must be proved. If a total want of probable cause is proved malice may be implied. But although express malice is proved some slight evidence of want of probable cause must be given. The court may, where the lunacy of a person is in question, interpose by making a provisional order for the care and custody of the person and the estate until the lunacy is finally determined. If the case is urgent the court will make the appointment upon an *ex parte* application (*Fountain, In re*, 37 Ch. D. 609). But this interference is provisional and arises *ex necessitate* in cases of emergency and is only allowed as subservient to the inquiry and while it is in progress. The order of the judge in lunacy directs the inquisition to be held (1) at or near the place of abode of the alleged lunatic if within the jurisdiction; and (2) when the alleged lunatic is not within the jurisdiction at the place in England where his mansion, house, or other property is situated. If he have no such property, then at his English residence; if he has no such residence, then in the county of Middlesex. This rule regarding holding the inquisition at or near the place of abode of the alleged lunatic is not, however, inflexible, and it has been occasionally departed from, when, e.g., there was reason to believe that a strong local feeling as to the proceedings existed in the neighbourhood where the alleged lunatic resided. The judge in lunacy may make an order to prevent the removal of an alleged lunatic out of the jurisdiction even before a commission is issued. But such an order will not be made except upon applicants satisfying the court that the party is a fit subject of a commission in lunacy, and that there is a reasonable apprehension of an intended removal. Whether the inquiry is with or without a jury, and wherever it is held, the proceedings are open to the public. If the medical witnesses for the alleged lunatic see him alone the medical witnesses on the other side are entitled to the same opportunity. Section 98 of the Lunacy Acts, 1890–91, enacts that the inquisition shall be confined to the question whether or not the alleged lunatic is at the time of the inquisition of unsound mind and incapable of managing himself or his affairs, and no evidence as to anything done or said by him or as to his demeanour or state of mind at any time, being more than two years before the time of the inquisition, shall be receivable in proof of insanity, or on the trial of any traverse of an inquisition, unless the person executing the inquisition otherwise directs. If upon such inquisition it appears that the alleged lunatic is of unsound mind, so as to be incapable of managing his affairs, but that he is capable of managing himself, and is not dangerous to himself or to others, it may be so specially found and certified.

Although the power of courts of law to prevent the publication of their proceedings pending litigation has been repeatedly affirmed it is now rarely exercised, and fair, accurate, and *bonâ-fide* reports of cases in any public court of justice, a category to which the Master's Court belongs, are privileged, unless the evidence is obviously unfit for publication. But comments on lunacy proceedings which are still *sub judice* may be punished as contempt and Section 99 of the Lunacy Act gives the Master in Lunacy, while employed in executing an inquisition, power to commit.

Looking Back.

FROM

THE LANCET, *SATURDAY*, August 23rd, 1828.

RODERICK MACLEOD, in reprinting the "Stanzas on Dr. Harrison," the week after they appeared in THE LANCET, states, that he would have published them sooner had he not been at the sea-side at the time they were transmitted to *him*, and that they were acknowledged in the Excrescence of the 19th of July. On turning to the Excrescence of that date, we find, as we had good reason to anticipate, no such acknowledgment; and the truth of the other part of RODERICK'S statement may be estimated, when we add, that we made an alteration, *proprio marte*, in the manuscript of our Correspondent, which alteration is faithfully copied in the Excrescence. This reminds us of SIMON PURE'S tranquil transcription from the pages of THE LANCET, in his exclusively *genuine* edition of Sir ASTLEY COOPER'S Lectures, of a long passage touching the connexion between literature and science, and the reciprocal influence which literary and scientific pursuits were supposed to exercise on each other. The passage is rather a fanciful one, and not, perhaps, very

sound in theory; but they who know the worthy Baronet, who is as innocent of all extra-professional information as Roderick Macleod, will readily acquit him of having ever digressed into a disquisition connected with literature or taste. The fact is, that the passage in question was an interpolation of our reporter, who, in garnishing the worthy Baronet's lecture with this somewhat unjustifiable piece of *fioriture*, little imagined that he was laying a trap to catch a Pure.

Public Health and Poor Law.

LOCAL GOVERNMENT BOARD.

REPORTS OF INSPECTORS OF THE MEDICAL DEPARTMENT OF THE LOCAL GOVERNMENT BOARD.

On the Sanitary Circumstances and Administration of the Rural District of Pocklington, by Dr. L. W. DARRA MAIR [1]—Many of the reports lately issued from the medical department of the Local Government Board afford evidence of the unsatisfactory manner in which rural district councils often perform their duties as sanitary authorities. The district of Pocklington in the East Riding of Yorkshire, which includes the town of Market Weighton and a large agricultural area in its vicinity, appears to be no exception to the rule. Sanitary government in this district, or what there is of it, is exercised by a rural district council which consists of 49 members who are also Poor-law guardians. The council meets in intervals of Poor-law business and has no committees for public health or sanitary purposes. The duties of sanitary inspector or inspector of nuisances are intrusted to two surveyors of highways who give nearly all their time to their surveyor's work. These officers Dr. Mair found not to be properly informed of elementary matters affecting the public health of the district; the inspector acting in Market Weighton, for example, was ignorant of the extent to which houses in that town are served by the public water-supply or are dependent on private wells, while the same officer protested against being required to give any assistance to the medical officer of health in dealing with cases of small-pox. The district is divided between two medical officers of health, an arrangement usually unsatisfactory and in this case attended by special drawbacks. Neither of the two surveyor-inspectors has an area corresponding to that of a medical officer, while the effect of the subdivision is that neither medical officer receives sufficient salary to enable him to devote adequate time to the work. The district council's meetings are not attended by either, and the inspectors who do attend are not in a position to give useful advice. It is not surprising in these circumstances that the council, without consulting either medical officer, put up a small-pox hospital which no one could use, or that money spent for "sanitary" purposes has habitually been expended to little advantage. Dr. Mair, in reviewing the situation, concludes that "it will seem to most people, and rightly, in my judgment, that the sanitary administration of this district in its present condition constitutes an actual danger to the inhabitants." He shows that many of the water-supplies of the place are unsafe, and that in consequence water-borne outbreaks of enteric fever have occurred from time to time in different localities, most recently in Shipton. "Examination of the records of the council show that during the past few years many samples of drinking water have yielded such bad results on analysis that the analyst has described them in such terms as 'filthy,' or 'enormously' polluted, a 'moderately dilute solution of sewage,' and so forth." Certain villages are in need of a system of public scavenging. Cowsheds are often in great need of supervision, as also is the character of the water used for washing milk utensils. In one instance serious drainage defects were discovered at a cowshed as a result of the occurrence of enteric fever on the adjoining premises. Dr. Mair found three years afterwards that an order of the council to remedy these defects had not been complied with.

On a Re-inspection of the Durham Rural District, by Dr. H. TIMBRELL BULSTRODE.[2]—This report relates to an important colliery district which was inspected in 1905 by Dr. R. A. Farrar, who reported to the Local Government Board on its sanitary conditions. As the district council took exception to this report, and disputed some of the statements which it contained, the Local Government Board took a practical, though somewhat unusual, course and sent a second inspector to inquire into the matters in dispute. As a result different parts of Durham rural district have been investigated by a party consisting of two inspectors of the Local Government Board (Dr. Bulstrode and Dr. Farrar), the county medical officer of health (Dr. T. E. Hill), and various members and officers of the district council. Dr. Bulstrode shows that the result of such thorough investigation was to emphasise the importance of the shortcomings of the district which had previously been pointed out. It was satisfactory to find that certain of the defects to which Dr. Farrar drew attention had already been remedied, and after the trouble which has now been taken by the supervising authorities to show this district council what is at fault it may be expected that further and substantial improvement will result. One of the most striking features of colliery districts in the north of England, specially noted by Dr. Bulstrode in the present case, is the contrast in the matter of cleanliness and general well-being between different villages the inhabitants of which are of the same class and occupation and receive the same wages. The character of the house accommodation is the dominant factor in the matter. Hardly less important is the condition of the roads. Where the road outside the dwelling is unmetalled and usually little better than a quagmire, as is too often the case, it can hardly be expected that the collier's wife will take pride in the cleanliness of her house or her children. Untidiness of the inhabitants and prevailing dirt in the road and backyards are prone to be seized upon by property owners—often colliery proprietors—as a reason for doing as little as possible to improve the structural conditions of dwellings or to abate overcrowding. Is it reasonable, they may ask, to expect us to incur expense for people with these habits of life? Moreover, one of these days the mine will be worked out and the cottages will be useless. Again, all colliery districts are liable to subsidence of surface and cracking of house walls in unexpected places and it is better for us to build cheaply and repair as little as may be. In short, there are numerous and plausible arguments with which to persuade the local authority to take "long views" of the situation and do nothing. But in such case the answer of the local authority, as Dr. J. C. McVail has told us in a well-known essay and as Dr. Bulstrode shows by reference to other colliery villages, should be to declare its preference for "short views"; to make up its roads; to get dilapidated houses repaired; to close dwellings unfit for habitation; to cleanse its middens; to put a stop to overcrowding; and generally to be content to do its best to mitigate present evils without troubling unduly about the future.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

The City of Manchester.—The estimated population of Manchester at the middle of 1905 was 631,933, the birth-rate for that year was 29·0, and the death-rate was 17·82 per 1000. The infantile death-rate was 164·42 per 1000 births. The general death-rate was much below that formerly recorded; Dr. James Niven points out, however, that Manchester has but shared in the general improvement and that her position amongst the large towns is much the same as usual. Associated with this low Manchester death-rate was the fact that flour and coal were cheaper than in previous years but the price of wheat was unaltered. It is curious that in these circumstances the amount of outdoor relief was much greater in 1904 and 1905 than in previous years, but Dr. Niven, while viewing this with apprehension, thinks that the increased outdoor relief may be partly attributed to a change of policy. Although he evidently regards indiscriminate outdoor relief as eminently undesirable, he suggests that, in cases where through the illness of the bread-winner or from other causes a number of children are without sufficient means of subsistence, an effort should be made to keep the family well nourished until the older children can work. He has approached the Charity Organisation Society as to this point but apparently its funds will only avail for more or less temporary distress. We are entirely in accord with Dr. Niven that "attention to this most pressing need would greatly aid in the diminution of disease, which fastens on neglected and ill-nourished children." He is apparently of opinion that work of this nature should be

[1] London, Wyman and Sons, Fetter-lane; Edinburgh, Oliver and Boyd; Dublin, E. Ponsonby. No. 236, price 3d.
[2] Ibid., No. 237, Price 3d.

done by private charity rather than by official outdoor relief, but possibly something approaching the Elberfeld system of relief, where the money is dispensed by unpaid visitors who are responsible for an economical and productive disposal of the poor-rate funds, might best meet the requirements of these cases. 24 per cent. of all the deaths in Manchester occur in its public institutions, and Dr. Niven thinks that possibly the maintenance of this high percentage represents a diminished aversion on the part of the poor to seek admission to the union hospitals.

An increase in the prevalence of diphtheria is taking place in Manchester at the present time, and the medical officer of health is consequently devoting more attention to the subject of its causation and control. During the year a circular was addressed to the medical practitioners urging them, in dealing with suspicious cases, at once to inject antitoxin and not to wait until their suspicions are confirmed by the bacteriologist; both the syringes and the antitoxin are at the disposal of medical practitioners on application at the town hall. "If," says Dr. Niven, "we could by sufficient promptitude in treatment avert the fatal issue of diphtheria we should be fulfilling one of the aims of the Public Health Act"; and he considers that it is difficult to see how a medical man can be relieved of responsibility if he fails to save a child under his care suffering from diphtheria, assuming that the fatal issue can be averted by injection of a sufficient amount of antitoxin within the first three days. So strongly does Dr. Niven feel upon this point that during recent months letters have been sent to practitioners when it has been doubtful whether antitoxin has been used. This attitude on the part of a medical officer of health raises some novel and interesting issues and we may add that we are far from antagonistic to the attitude adopted, though it indicates an individualistic tendency on the part of the public health authorities. It is pointed out in the report before us that diphtheria is largely spread by "carrier" and unrecognised cases in schools and elsewhere, and the medical officer of health remarks, "All these are conditions which a sanitary inspector cannot be expected to ascertain or to deal with; yet to discover them and prevent them from remaining sources of danger is the essence of the prevention of diphtheria"; and he then pleads both with respect to diphtheria and scarlet fever for the services of a "medical investigator," who would be able to undertake the requisite investigation rapidly and to administer preventive doses of antitoxin when requisite. In Dr. Niven's view "the power of isolation in hospital to limit the spread or fatality of scarlet fever and diphtheria is but limited and more preventive value could be got, in my opinion, by increasing the staff of the medical officer of health." As regards diphtheria "contacts," he adds: "As for the wholesale isolation of contacts I do not believe it to be practicable here and I am not clear that it is desirable."

Much work was done in 1905 on the investigation of enteric fever, a disease which, falling mainly on those at ages from 10 to 45 years, is of considerable economic importance. The conclusions of the investigators are to the effect that the disease is spread in Manchester largely by failure to recognise the disease, especially in the case of children; its infective power is "fairly high and this is also particularly obvious in children." In the prevention of the disease skilled inquiry by trained health officers is likely to produce the greatest results at a minimum cost, and Dr. Niven is careful to point out that the best results are not to be obtained by the ordinary routine methods of the sanitary inspectors, useful as they may be. Shell-fish have, we are told, a decided influence in maintaining the prevalence of enteric fever and diarrhœa in Manchester, and in order that cases thus caused can be properly investigated further powers are necessary for procuring information with reference to the sources of the infected shell-fish. Mussels not properly cooked should not, in his opinion, be used as an article of food. He thinks, too, that probably flies play a part in the spread of enteric fever in August and September, and that therefore steps should be taken towards the destruction of the house-fly and its eggs. Dr. Niven has evidently, like others, found considerable difficulty in procuring from the wholesale shell-fish merchants the names of the "layings" from which supplies of shell-fish were furnished to retail dealers involved in the sale of suspected mussels. He has, however, obtained sufficient information to raise suspicion against certain layings on the Welsh and Irish coasts, and he adds that he will not be satisfied of their freedom from pollution without examination either by himself or by the Local Government Board. Curiously enough, Dr. Niven makes no reference to any Dutch mussels, but whether this is because none of these imported molluscs are consumed or because none have come under suspicion is not clear. Certainly a large number of mussels are imported into this country from Holland. We are quite in agreement with Dr. Niven that the local authority should be in a position to obtain the name of any laying or natural gathering ground from which any given mussels have been procured, and that shell-fish hawkers should be duly registered. Provisions such as these should be embodied in any fresh Public Health Bill unless in the meantime Manchester can secure such powers for herself by means of a local Act. But possibly the shortest way of bringing about amendment of the law as regards shell fish generally would be to urge the Local Government Board to promote legislation on the lines recommended by the Royal Commission on Sewage Disposal. Dr. Niven is clearly in need of further professional assistance to enable him to carry on the admirable investigations which he has in hand and in contemplation, and every medical officer of health who is at the same time an epidemiologist will agree that no sanitary inspector can bring to bear upon these etiological investigations the knowledge necessary to enable their full value to be brought out. It is to be hoped that the future will see a very considerable increase in the number of assistant medical officers of health throughout the country.

A capital summary of the measures taken in Manchester towards the better control of tuberculosis is furnished in the report, and with regard to the system of voluntary notification Dr. Niven makes the following somewhat significant remarks: "It has been believed by many that a scheme of notification would fail unless there were a hospital to which cases might be sent by the authority dealing with notification. This is not the case. But there is more in this view than I had at first supposed. Even supposing Bowdon Hospital and the Hardman-street out-patient department had not been in existence it would still have been advisable to begin with a notification scheme so that the needs of the community might be ascertained and much useful work would have been done by way of instruction. But it has to be remembered that to sustain household visits month after month, perhaps for years, becomes rather trying and demands great tact and management from the visitor as well as judgment on the part of the person visited." But Dr. Niven is inclined to believe that the death-rate from pulmonary tuberculosis is beginning to show a result from the work which has been done in consequence of notification since 1899, and all who know Dr. Niven and his work will trust that his hopes may be realised.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In 76 of the largest English towns 8377 births and 5157 deaths were registered during the week ending August 18th. The annual rate of mortality in these towns, which had steadily increased in the five preceding weeks from 11·7 to 14·6 per 1000, further rose to 17·0 in the week under notice. During the first seven weeks of the current quarter the death-rate in these towns averaged 13·4 per 1000, the same rate having also prevailed in London. The lowest death-rates in the 76 towns last week were 6·5 in Handsworth, 6·6 in Hornsey, 7·2 in King's Norton, and 7·3 in Devonport; the rates in the other towns ranged upwards to 26·0 in Tynemouth, 26·1 in Middlesbrough, 26·8 in Wigan, and 28·9 in Birkenhead. The 5157 deaths in the 76 towns showed a further increase of 733 upon the numbers returned in recent weeks, and included 1623 which were referred to the principal epidemic diseases, against numbers increasing from 361 to 1105 in the five preceding weeks; of these no fewer than 1385 resulted from diarrhœa, 103 from measles, 50 from diphtheria, 42 from whooping-cough, 25 from scarlet fever, 18 from "fever" (principally enteric) and not one from small-pox. The deaths from these principal epidemic diseases were equal to an annual rate of 5·3 per 1000 in the 76 towns and to 5·4 in London. No death from any of these epidemic diseases was registered last week in Bournemouth, Reading, Halifax, or Stockton-on-Tees; whereas they caused annual death-rates equal to 11·9 per 1000 in Norwich and Leyton, 15·0 in West Ham, and 16·0 in Birkenhead. The deaths referred to diarrhœa, which had steadily increased

in the ten preceding weeks from 50 to 865, further rose last week to 1385; the highest annual rates from this disease last week were 8·0 in East Ham, 8·2 in Birmingham, 14·0 in West Ham, and 14·2 in Birkenhead. The largest proportional fatality from measles occurred in Rotherham, Tynemouth, Stockport, Norwich, and Huddersfield; and from whooping-cough in Walsall and Swansea. Of the 50 deaths from diphtheria 15 occurred in London, eight in Manchester and in Salford, three in Portsmouth, and three in Bradford. The 25 fatal cases of scarlet fever included eight in London, four in Manchester, and two in Birmingham. Three deaths were referred to "fever" in Portsmouth and four in London. No case of small-pox was under treatment in the Metropolitan Asylums hospitals during the week, no case having been admitted since the end of June. The number of scarlet fever cases under treatment in the Metropolitan Asylums hospitals and in the London Fever Hospital, which had been 3120 and 3051 at the end of the two preceding weeks, further declined to 3046 on Saturday, August 18th; 317 new cases were admitted to these hospitals during the week under notice, against 415 and 308 in the two preceding weeks. The deaths referred to pneumonia and other diseases of the respiratory organs in London, which had been 101, 111, and 112 in the three preceding weeks, further rose to 119 last week, but were 19 below the corrected average in the corresponding week of the four preceding years, 1902–05. The causes of 39, or 0·8 per cent., of the deaths registered in the 76 towns during the week under notice were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in London and in 53 other of the 76 towns; the proportion of uncertified causes of death showed, however, a considerable excess in Gateshead, Sunderland, South Shields, and Wigan.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in eight of the principal Scotch towns, which had been equal to 11·8 and 14·0, per 1000 in the two preceding weeks, further rose to 14·4 during the week ending August 18th but was 2·6 below the mean rate in the same week in the 76 English towns. The rates in the eight Scotch towns ranged from 10·7 in Leith and 11·8 in Greenock to 19·2 in Paisley and 19·6 in Perth. The 492 deaths in the eight towns exceeded the number in the previous week by 11, and included 37 which were referred to diarrhœa, 11 to whooping-cough, four to measles, four to diphtheria, four to "fever," one to scarlet fever, and not one to small-pox. In all 61 deaths resulted from these principal epidemic diseases in the week under notice, against 50 and 64 in the two preceding weeks; they were equal to an annual rate of 1·8 per 1000, which was no less than 3·5 below the rate from the same diseases in the 76 English towns. The deaths attributed to diarrhœa in the Scotch towns, which had steadily increased in the four preceding weeks from 11 to 34, further rose last week to 37, of which 18 occurred in Glasgow, seven in Dundee, five in Paisley, and three in Edinburgh and in Aberdeen. Seven of the 11 fatal cases of whooping-cough were returned in Glasgow and two in Aberdeen, in which latter town two of the four deaths from measles also occurred. The four deaths referred to "fever" included three in Glasgow (all of which were certified as cerebro-spinal meningitis) and one in Perth. The deaths in the eight towns referred to diseases of the respiratory organs, including pneumonia, which had been 52, 61, and 68 in the three previous weeks, were again 68 last week, and exceeded by 28 the low number returned in the corresponding week of last year. The causes of 11, or 2·2 per cent., of the deaths registered during the week were not certified; the proportion of uncertified deaths in the English towns did not exceed 0·8 per cent.

HEALTH OF DUBLIN.

The annual death-rate in Dublin, which had been equal to 16·8 and 17·3 per 1000 in the two preceding weeks, further rose to 19·7 during the week ending August 18th. During the first seven weeks of the current quarter the death-rate in the city averaged 18·6 per 1000, the death-rates during the same period being 13·4 in London and 12·9 in Edinburgh. The 143 deaths of Dublin residents during the week under notice showed a further increase of 17 upon the numbers returned in the two preceding weeks, and included 29 which were referred to diarrhœa, one each to measles, whooping-cough, and "fever," and not one either to small-pox, scarlet fever, or diphtheria. These 32 deaths from the principal epidemic diseases showed a further increase of 13 upon recent weekly numbers and were equal to an annual rate of 4·4 per 1000, the death-rate last week from the same diseases being 5·4 in London and 0·9 in Edinburgh. The 29 fatal cases of diarrhœa in Dublin showed an increase of 19 upon the number in the previous week, whereas the fatality of other epidemic diseases showed a marked decline. The deaths both of infants and of elderly persons considerably exceeded the numbers in recent weeks. Three inquest cases and two deaths from violence were registered; and 38 per cent. of the deaths occurred in public institutions. The causes of all the deaths registered during the week, except one, were duly certified by a registered medical practitioner or by a coroner, and the causes of all the deaths in London and in Edinburgh were duly certified.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments are notified:—Fleet Surgeons: H. W. G. Poyne to the *Bulwark* and G. T. C. Collingwood to the *President*, for London recruiting headquarters; C. C. Woodwright to Portland Hospital; and G. A. S. Bell to the *Irresistible*. Staff Surgeons: Y. D. S. Milln to the *Proserpine*, and on recommissioning. Surgeons: R. S. Osborne to the *Merlin*, on commissioning; W. L. Hawkins to the *Leda*, on recommissioning; J. R. Muir to the *President*, for three months' study at Dreadnought Hospital, Greenwich; and G. S. Davidge to the *President*, for three months' study at West London Hospital.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel T. H. Corkery, retired list, is appointed to the medical charge of the troops at Exeter, and Major A. R. Aldridge is appointed Sanitary Officer at the Indian Army Headquarters.

INDIAN MEDICAL SERVICE.

The King has approved of the following promotion made by the Government of India:—*Madras:* To be Colonel: Lieutenant-Colonel William O'Hara (dated May 28th, 1906).

The King has also approved of the retirement from the service of the undermentioned officer: Lieutenant-Colonel David Prain, C.I.E. (dated July 31st, 1906).

VOLUNTEER CORPS.

Rifle: 2nd (Berwickshire) Volunteer Battalion (the King's Own Scottish Borderers): David Robert Taylor (formerly Lieutenant) to be Surgeon-Lieutenant (dated August 18th, 1906). 1st (Ross Highland) Volunteer Battalion, Seaforth Highlanders (Ross-shire Buffs, the Duke of Albany's): Surgeon-Lieutenant R. Brodie to be Surgeon-Captain (dated August 18th, 1906).

ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

Eastern Command: Maidstone Companies: Joseph Ward to be Lieutenant (dated August 1st, 1906). Bedford Bearer Company: Lieutenant C. H. Perram to be Captain (dated August 18th, 1906). Sussex and Kent Bearer Company: Major J. Turton (Brigade-Surgeon-Lieutenant-Colonel, Senior Medical Officer, Sussex and Kent Volunteer Infantry Brigade) to be Lieutenant-Colonel (dated August 18th, 1906).

ROYAL HOSPITAL, CHELSEA.

Lieutenant-Colonel R. W. Ford, D.S.O., R.A.M.C., having completed five years' service as deputy surgeon of the Royal Hospital, Chelsea, leaves that establishment and is succeeded by Lieutenant-Colonel R. J. C. Cottell, who served in South Africa in 1899 to 1902. Colonel Ford is under orders for Gibraltar.

ENTERIC FEVER IN INDIA.

The Government of India has sanctioned the formation of a standing committee for the purpose of investigating and advising on enteric fever in India and its prophylaxis. The undermentioned officers, nominated by the Commander-in-Chief, have been appointed to the committee:—President: Surgeon-General W. L. Gubbins, principal medical officer of His Majesty's forces in India; Vice-President: Surgeon-General A. Scott Reid, principal medical officer of the Northern Command; Members: Colonel R. H. Forman,

principal medical officer of the Bombay Brigade; Lieutenant-Colonel T. P. Woodhouse, Captain L. W. Harrison, Captain E. B. Knox (secretary), Captain A. B. Smallman, and Lieutenant E. J. H. Luxmoore, Royal Army Medical Corps. Nominated by the Home Department:—Members: Lieutenant-Colonel J. T. W. Leslie, Sanitary Commissioner with the Government; Lieutenant-Colonel D. Semple, Director of the Central Research Institute; Major G. Lamb and Captain E. D. W. Greig, I.M.S. Lord Kitchener presided on July 31st at Simla over the first meeting of the committee and gave a long and interesting address in which he set forth the aim and object with which the committee had been constituted and briefly outlined the work which lay before it. The Commander-in-Chief in his address passed in review the great advances which had been made and not only showed that he had been uncommonly well posted up in this respect but that he was able, from his own point of view, to make some practical and suggestive remarks on the subject and practice of anti-typhoid inoculation.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

The number of this journal for the present month is a good one. Lieutenant-Colonel A. M. Davies, R.A.M.C., continues his papers on the reports of the Commission for the Investigation of Mediterranean Fever and deals with various points connected with the sanitary condition of the barracks in Malta under the general headings of situation, construction, water-supply, and drainage. There are also contributions on the Health of the Soldier, with Special Reference to Preventable Diseases, by Lieutenant-Colonel H. J. Barratt, R.A.M.C., one of a descriptive and practical nature by Major P. G. Ievers, R.A.M.C., on Rider's Sprain, and Colonel David Bruce, R.A.M.C., C.B., F.R.S., deals with South African Stock Diseases. The Removal of Wounded in Hill Warfare, by Captain W. W. Jeudwine, I.M.S., gives an account of a method recently practised by the 30th Punjab Infantry. It is needless to say that the removal of wounded men in Indian mountain warfare is often attended with extreme difficulty. The Inspection of Tinned Foods, by Major W. W. O. Beveridge, D.S.O., R.A.M.C., is mainly based upon experience acquired in the South African War. There are besides the foregoing several other papers of a scientific, bacteriological, or clinical nature.

Correspondence.

"Audi alteram partem."

GOATS' MILK FOR INFANTS.

To the Editors of THE LANCET.

SIRS,—In the *Daily Telegraph* of August 15th the following report appears:—

Yesterday at the Battersea coroner's court Mr. John Troutbeck held an inquest on the body of Tomasso Cammindilio, aged seven months, son of an ice-cream vendor, living in Sheepcote-lane, Battersea. The coroner interpreted the evidence which was given in Italian. It appeared that the child, which weighed only a little over four pounds, had been fed for six months on goats' milk, and the father explained that he resorted to this because he considered it lighter than cows' milk. Dr. Freyberger said death was due to malnutrition. Goats' milk was worse than skimmed milk and did not contain sufficient fat or sugar. A verdict of death from natural causes was recorded.

It would be interesting to know where Dr. Freyberger obtained the analysis which enabled him to state on oath that "goats' milk was worse than skimmed milk and did not contain sufficient fat or sugar."

Turning to Stevenson and Murphy's "Treatise on Hygiene and Public Health" I find the percentage constituents of the human, cows', and goats' milk given as follows:—

—	Total solids.	Proteids.	Fats.	Milk sugar.	Salts.	Water.
Human	12·59	2·29	3·73	6·21	0·31	87·41
Cows'	12·83	3·55	3·69	4·63	0·71	87·17
Goats'	14·29	4·29	4·73	4·46	0·76	85·71

Whereas the composition of skimmed milk is given as: proteids, 4·03; sugar, 4·04; fat, 1·09; and water, 90·12 (vol. i., pp. 427 and 436). On reference to Pavy's "Treatise on Food," second edition, p. 185, we find the statement that:—

The milk of the cow ..... the most closely approximates to that of woman but is rather more highly charged with each kind of solid constituent. Next follows the milk of the goat which taken altogether is again rather richer.

These references are, I think, quite sufficient to prove what I had hitherto believed was a matter of common knowledge—namely, that goats' milk is rich in all the constituents of a perfect food and not to be compared with skimmed milk as a form of nourishment. That it is also a useful food for children is shown by the following extract from Dr. Eustace Smith's classical book on "The Wasting Diseases of Infants and Children" (sixth edition, pp. 43, 44).

With some children, in spite of all possible precautions, cows' milk, however carefully it may be prepared and administered, cannot be digested. ..... In such cases, if there are objections to a wet nurse, recourse must be had to the milk of some other animal, and preference should be given to a milk which contains a smaller proportion of casein than that found in the milk of the cow, such as goats' or asses' milk.

The milk, it is true, has an unpleasant smell, but the sense of smell is not well developed in children (Holt's "Diseases of Children," p. 27) and infants do not appear to mind the disagreeable odour. Dr. Freyberger might have gathered from the many papers on Malta fever which have appeared during the past few months that in Malta the *only* milk available is goats' milk. I can only hope that Dr. Freyberger's evidence is incorrectly or imperfectly reported.

I am, Sirs, yours faithfully,

R. J. BLACKHAM, D.P.H. R.C.P.S. Lond.,
August 20th, 1906. Captain, R.A.M.C.

*** We refer to this question in an annnotation.—ED. L.

THE POSSIBLE IMPORTANCE OF EARTH-WORMS AS A FACTOR IN THE SPREAD OF DISEASE.

To the Editors of THE LANCET.

SIRS,—In an article under the above heading which appeared in your issue of July 28th, Dr. Charles F. Fraser describes certain parasitic nematodes found both in the alimentary canal and encysted in the tissue of the common earth-worm *Allolobophora*. The descriptions and drawings that he gives do not permit of the identification of this nematode but it is most probably *Pelodera pellio* A. Schneider. Schneider points out that the larvæ of this species live encysted in the body cavity of earth-worms and are especially numerous in or on the septa. The adults live in damp earth or rotten substances. Another nematode parasitic in the earth-worm is *Ascaris* sp., described by Leuckart, whose second host is probably the mole and possibly also certain carnivorous birds. A third species, named *Discelis filaria* Dujardin, appears to have occurred but once in earth-worms at Paris; although sought for it has not been found again. Finally, we have a fourth nematode, *Spiroptera turdi* Molin, which infests earth-worms. The larva of this parasite is common in earth-worms in Central Europe. It is only found in the ventral vessel but throughout its entire length. The adult form occurs in the various species of *Turdus*, the redwing, the blackbird, song-thrush, and also in the starling. A fuller account of the round worms parasitic in earth-worms will be found in my paper "On the Nematodes Parasitic in the Earth-worm," in the *Archives de Parasitologie*, Vol. VI., 1902, p. 619.

I am, Sirs, yours faithfully,

A. E. SHIPLEY.

Christ's College, Cambridge, August 15th, 1906.

THE PROPHYLAXIS OF MUMPS.

To the Editors of THE LANCET.

SIRS,—When we medical men are called into a household one of whose members is found to be suffering from some contagious malady we are, I fear, usually content with carefully shutting the stable door after the horse has escaped. In other words, we isolate the one sufferer and go away leaving the others to take their chance, with the practical certainty that at the end of the incubation period one or more other members of the household will become ill with the same disease. That this need not always be the case the following instance exemplifies, though of course it cannot be held to absolutely prove anything.

Ten weeks ago I was called to see a young lady pupil teacher in a school of 18 young girls. She had arrived at the school 48 hours before I saw her and had well-marked mumps. During this 48 hours she had been in close association with the girls during the daytime and had slept in the same dormitory for two nights with several of them. None of the girls had ever had mumps as far as I could ascertain. The torch and the magazine were therefore thoroughly introduced to each other. Instead of waiting for the almost inevitable explosion to follow (a course, I fear, that I have pursued before now), with the help of the head mistress I instituted a regular drill twice daily, which consisted in each girl thoroughly washing out her mouth and gargling with an antiseptic lotion under direct supervision. This was kept up for a fortnight and no case of mumps occurred in the school. I claim no originality for this idea, which has probably suggested itself ere now to many others, but I intend to try some similar plan in my next household that shall have a case of scarlet fever. The specific organism in each disease probably takes some hours to reach a site where it can comfortably grow and multiply and our endeavours should be directed to slaying it or them before they get safely located.

I am, Sirs, yours faithfully,

Caterham Valley, August 20th, 1906. W. BLIGH, M.D. Lond.

ANALYSIS OF SUSPECTED FOODSTUFFS.

To the Editors of THE LANCET.

SIRS,—A patient of mine after eating certain brown bread was taken with violent pain and vomiting, and her mother also was sick on eating the bread. A sample of it was brought to me and showed minute blue specks all over and through its substance. I sent some to the medical officer of health of the district where my patient lived and he, although he sent some on to the county analyst, affirmed himself in no way responsible for its analysis. The Maidstone analysts declined to examine the substance, although the Home Office referred me to them. Now what am I to do? Are the public to be semi-poisoned and no one to be responsible for an inquiry into the cause? I offered the usual fee for its analysis in vain, yet I fail to see why the medical man (to whom the complaint is generally made) should bear the cost of tracing the cause of such trouble. The baker from whom came the bread had promptly returned the flour to the millers and would not or could not give any information. Trusting that one of your numerous readers may enlighten me as to the law on the point,

I am, Sirs, yours faithfully,

Penge, S.E., August 18th, 1906. HERBERT GREENWOOD.

BULLET EXTRACTED AFTER BEING 42 YEARS IN THE BODY.

To the Editors of THE LANCET.

SIRS,—Some time ago I was asked to attend a man for a swelling in the calf of his leg, which prevented him walking. On examination the swelling appeared to be in connexion with a hard foreign body situated deep down in the tissues. I made an incision into this mass of inflamed substance and dissected out a flattened bullet. The patient was a pensioner and formerly belonged to the Royal Marines. He received a shot in his hip during an action off the West Coast of Africa while serving on board H.M.S. *Madagascar*. He was in consequence invalided home and for 42 years this bullet had gradually worked its way from the hip to the calf, where it was extracted owing to the irritation it produced.

I am, Sirs, yours faithfully,

Ealing, W., August 22nd, 1906. EDWIN CHILL, M.D. Edin.

WHAT IS A SPECIALIST?

To the Editors of THE LANCET.

SIRS,—The discussion about "specialists" has been most opportunely started by "A. Z." in THE LANCET of July 28th, p. 258. I have always failed to see why it should be considered unprofessional for a medical practitioner to intimate on his door-plate, bills, &c., the fact that he practises a special branch of his profession, to which he has devoted special time and energy. And this the more as I am fully aware that the present system of unavoidably coupling specialisation with hospital appointment is not only a hindrance to the bringing out of what is best in our young and talented practitioners but is also a means of foisting on the public many men as specialists who have often nothing more "special" about them than their attachment to a hospital. The letter of "F.R.C.S. Eng., M.D." in THE LANCET of August 18th, p. 463, brings out that very forcibly and whoever has worked within the walls of a hospital will doubtless have met such instances as he has mentioned.

As the system stands at present it is only the fortunate few, who have managed to catch a timely connexion with a hospital, who are recognised and known as specialists. The public in order to find a specialist can only turn either to the lists of the hospital staffs or to the private practitioner who has generally no better information to give, especially if he chances to be a stranger in the town in which he practises. And, furthermore, why, I ask, is the specialist to be prevented from proclaiming openly to the public what everybody takes for granted? Why is he to be dependent on the goodwill of his fellow-practitioners to recommend and send patients to him?

In Germany and Austria (of both of which I have experience) it is a common custom for the general practitioner to indicate on his door-plate that besides being a "practischer arzt" (general practitioner) he has made a "specialität" (speciality) his own, a fact which does not seem to affect the status of the "real specialist" who comes in for his share of legitimate work. There, indeed, the latter is the specialist *κατ' ἐξοχήν*, because in the earlier stages of specialisation he has the competition of the general practitioner, and it is only when he has attained eminence in his branch (which eminence varies according to the standard of the town) that he is looked upon as differing from the general practitioner.

I think a good deal of mere conservatism clings to our profession and an imaginary standard of honour results. Surely it is no advertisement, but the mere open statement of an understood fact, that a man who has specialised (if we recognise specialisation at all) intimates this to his friends, patients, and would-be patients. I for one should be glad to see this done—the sooner the better.

I am, Sirs, yours faithfully,

August 21st, 1906. S. H.

VITALITY OF THE EXCISED MAMMALIAN HEART.

To the Editors of THE LANCET.

SIRS,—I was recently a passenger in a train when about 40 miles from London a woman was run over. Her body was divided into two across the thorax and nearly the whole heart—the ventricles and portions of the auricles—had somehow been jerked out and lay quite apart. The ventricles were still making irregular but definite contractions, exactly like those which may be seen in the heart of a frog after prolonged exposure. It was at least a minute, and I think possibly two minutes or more, after the injury was inflicted before I was in a position to make this observation and the movements had apparently ceased in another minute or two when I had to re-enter the train. Possibly it is not generally known that the mammalian heart may so clearly exhibit its powers of independent action. In any case the opportunity of observing such muscular contractions in the human heart must arise very rarely.

I am, Sirs, yours faithfully,

August 17th, 1906. F.R.C.S. EDIN.

ROYAL CORNWALL INFIRMARY, TRURO.—The annual meeting of the subscribers to this institution was held on August 13th under the presidency of the Hon. John Boscawen. The medical report stated that during the past year 473 in-patients had been admitted, against 476 in the previous 12 months. 1165 out-patients had been treated, compared with 1003 in the preceding year. The annual cost per bed was £57 6s. In 1905 Sir Robert Harvey gave £1000 for endowing a bed to the memory of the late Lady Harvey and in January, 1906, he gave a similar sum for endowing a bed in memory of his late son. The financial statement showed that the expenditure exceeded the income by £196 and the committee state in the report that unless the deficiency is met one of the wards must be closed. The report of the committee of the Perranporth Convalescent Home for Men (founded and endowed by Mr. Passmore Edwards) stated that 114 patients had been admitted during the year and the financial statement was satisfactory.

THE MEDICAL AND HYGIENIC ASPECTS OF LISBON.

DISINFECTION AND NOTIFICATION FOR TUBERCULOSIS.—THE ISOLATION HOSPITALS.—THE LARGEST HOSPITAL.—THE INSTITUTION AND DIPLOMA OF HYGIENE.—CHEAP DWELLINGS.—ABANDONED CHILDREN.—MOTHER'S MILK.

(FROM OUR SPECIAL SANITARY COMMISSIONER.)

THE Fifteenth International Congress of Medicine meeting at Lisbon this year has undoubtedly helped to make known to the British tourist and traveller that Portugal is at once an accessible and interesting country. On inquiry I find that more passages than usual have been booked for Lisbon this summer. For instance, almost every berth on the last two Booth line steamers sailing from Liverpool and Havre for Oporto, Lisbon, and Madeira, was taken. This is the more remarkable as it is not the best time of the year; Portugal is more pleasant in the late autumn and early spring. However this may be, the fact that the tide of tourists is already beginning to flow in that direction recalls to my mind that I have not yet completed the description of the many interesting institutions I visited while in Portugal for the International Congress of Medicine. Among other things and as a matter which directly affects tourists, I did not describe the means taken for isolation and disinfection at Lisbon. The fear of contracting some infectious or contagious fever has deterred many British tourists from going to the continent. This was justified by the fact that there were many places where the necessary precautions were not enforced. Now, on the contrary, not only is such neglect exceptional but in many localities better measures are adopted than those in vogue in England. For instance, in Portugal, according to a law which dates as far back as 1868, the notification of infectious diseases is rendered obligatory. Disinfection is now practised in all cases of typhus fever, typhoid fever, scarlet fever, diphtheria, cerebro-spinal meningitis, plague, cholera, yellow fever, and even for tuberculosis. It was on August 30th, 1902, that tuberculosis was added to the list. In notifying tuberculosis the medical attendant must not only describe the case but also state what measures he thinks are necessary. Indeed, the whole of the scheme for dealing with this disease is so radical that nothing short of an economic revolution could render its strict application possible. For instance, a fine of 4000 reis is inflicted on agencies, offices, and information bureaux recommending or introducing domestic servants unless they can produce a medical certificate not more than three months old which declares that the applicant for employment has been vaccinated, and is not suffering from tuberculosis or other contagious disease. It appears that this rule is carried out fairly well at Lisbon, at any rate in regard to domestic servants and also as to journeymen bakers.

The principle, however, that no one suffering from pulmonary tuberculosis should be allowed in a workshop, factory, mill, or any other place of employment where he might possibly contaminate healthy fellow-workers, though advisable from the prophylactic point of view, is not practicable in the present economic conditions of Portugal, putting aside all other arguments against it. There are neither the financial means nor the sanatoriums to provide for the existence of the many thousands of persons such a measure would throw out of work. What is more practicable, and this is done, is the infliction of fines on all hotel or lodging-house keepers and others who let an apartment or a room which has been previously occupied by a tuberculous patient without its having been duly disinfected. No such guarantee exists in England and on taking apartments at the seaside it might so happen that they had just been vacated by someone even in an advanced stage of tuberculosis. In Portugal also the provision of spittoons is much more general than in England and the spittoons are of a better model. They are of enamelled metal on stands, so as to be raised 18 inches or two feet from the ground. The expectoration is thus not so likely to fall on the floor but is immersed in the disinfecting solution that is within the spittoon. These spittoons are to be found in every sort of building where the public is likely to congregate, including the churches. Though I have visited many countries I do not remember having seen anywhere such ample provision of spittoons as at Lisbon. This is a simple and inexpensive precaution and yet it must be of great practical service in preventing the contamination of the atmosphere by desiccated sputum. The civil governors have the right to enact by-laws by which persons who do not avail themselves of the spittoon but spit on the ground can be prosecuted and fined.

So thoroughly is tuberculosis considered a contagious disease that the hospital for the treatment of this malady is on the same grounds as the hospital for the isolation of infectious or contagious fevers. This is situated in the district of Rego on an open, uninhabited space to the north of Lisbon. The larger portion of the grounds is devoted to the treatment of epidemic diseases. In the centre there is a broad tree-planted avenue with seven one-storey pavilions on each side. These pavilions hold 33 beds. Then behind them there are smaller structures, some with only six beds and others with 15 beds. Thus various diseases can be readily separated from each other. In normal times only a few of the pavilions are occupied, but the beds are in readiness and in a few hours any of the reserve buildings would be prepared to receive patients. Altogether there are for both sexes 516 beds.

A railing and a garden separate this fever hospital from another cluster of buildings designed for the treatment of tuberculosis. The two services seemed to me very near each other. This proximity may be useful in economising trouble and cost of land and administration, but I am doubtful if it is altogether wise to keep tuberculous patients in the neighbourhood of infectious fevers, and notably of small-pox. There are 212 beds for cases of tuberculosis in a simple building three storeys high. Very ample space is given. No curtains are allowed; everything is beautifully white, clean, enamelled, and easy to wash. There is a broad expanse of country to look out upon from the windows. Six-inch apertures near the ceiling and near the floor assure a current of air when the windows are closed. At the end of the dormitories a splendid sitting room and dining room is provided, three of the walls being entirely of glass and giving on to broad verandahs, and here the patients, though sheltered, enjoy the open air. A large portion of the glass framework is on hinges and can be opened so that the air has free access to the dining room. Nevertheless, and for semi-outdoor treatment, I much prefer the pavilion which I have already described when speaking of the Estaphania Hospital.[1] As this structure is of but one floor the entire length of the apex of the roof is open, a smaller roof being placed over the aperture to prevent the rain entering but leaving space for the passage of air. The flooring stands some distance off the ground which is covered with concrete and kept dry. The boards do not touch each other so that air enters between each board and for the whole length of the ward. Then there are all round windows and doors giving on to a terrace and verandah. Thus air gains access to the patients from all directions, yet they are sheltered from rain and the sun. At the hospital for tuberculosis the dirty linen is not carried out of the wards and down the stairs but is dropped into a shaft, where it falls into a metallic receptacle placed at the bottom. This receptacle stands on wheels, so that it can be readily conveyed to the laundry or the disinfecting station, which are not far away. The dust, the sweepings, and the refuse are also placed in closed metallic receptacles and wheeled away to be destroyed in the furnace or used as manure. At the disinfection station there is a bath for the employees. Policemen, cabmen, ambulance men, and others who assist to bring patients are all bathed, and their clothes are disinfected before they are allowed to return to town. The homes of tuberculous patients are also disinfected by the authorities and this is done gratuitously for the poor.

By far the largest hospital at Lisbon is next door to the new medical schools which were inaugurated by the Fifteenth International Congress of Medicine. A large portion of this building was originally a convent, and outside the main entrance there still remain 12 fine statues of the Apostles. Inside a majestic staircase and hall are ornamented with Portuguese delf tiles which represent hunting scenes, while the roof is painted with beautiful fruit and flowers. These topics can scarcely be considered suitable either for a convent or for a hospital, yet they have been recently restored and convey an impression of grandeur which, in any case, is a pleasant variation of what is usually seen at hospitals. From

[1] See THE LANCET, April 21st, 1906, p. 1138.

the technical point of view it is surprising how well this old building has been adapted and rendered healthy by through ventilation and the piercing of numerous windows into the antique walls. Here there are paying wards where strangers taken ill at Lisbon may obtain better nursing than would be possible in a hotel. But if the main part of the building is old, there are several annexes that are quite modern. This is notably the case with regard to the laboratory for clinical analyses, for the application of the Roentgen rays, and for the Finsen system of treatment. For all these purposes a special pavilion has been built in the gardens and is under the direction of Dr. Azevedo Neves who was one of the secretaries of the International Congress of Medicine.

As especially typical of the progress being accomplished in Portugal the Institute of Hygiene should be mentioned. It is beautifully situated on high ground commanding a magnificent view of the Tagus and the port of Lisbon. Here hygiene is taught, notably by the inspector-general of the sanitary services, Professor Ricardo Jorge. The object is to instruct medical practitioners and civil engineers, so that they may obtain diplomas in public health questions. This diploma is now necessary before they can be nominated to a post in the administration of any of the sanitary services. There is here a small but very practical museum where various methods of domestic drainage can be studied with working models. Many systems of ventilation and other kindred subjects are at the disposal of students. Then there are chemical laboratories. Here some 40 samples of milk are analysed every day, together with cheese and other alimentary substances. A good deal of adulteration has been detected at the Institute of Hygiene and this work also serves the purpose of demonstration and teaching.

In the application of these lessons to actual life it is necessary to remember that this Institute of Hygiene was only created by a law enacted on Dec. 24th, 1900. It was the direct outcome of the alarm caused by the several cases of plague that had occurred at Oporto. There has not been much time for the courses of instruction and the diplomas in hygiene now given to affect the general population. Indeed, I was not favourably impressed when taken to see some cheap dwellings where four very small rooms may be rented for about 12*s.* a month. In English towns this would be a very low rent, but in Portugal the wages earned are also very low. It is calculated that each square metre of construction cost £2 2*s.* 5*d.* The company which has built some 45 such cheap dwellings has paid its shareholders 4 and 4½ per cent. interest. More interesting than these dwellings are the 12 asylums situated in different parts of Lisbon to receive, during the day time, children who are abandoned or cannot remain at home because their parents are at work. Here these children are fed, given primary instruction and also are instructed in some manual work. Altogether some 2000 children are thus cared for every day at Lisbon.

Another admirable institution is an adaptation of the French *goutte de lait*. Here are model stables with 16 milch cows. Poor mothers come and are advised as to their infant children and the diet they, as mothers, should take; for every effort is made to encourage mothers to suckle their own children. When necessary suitable food for this purpose is given to them. When they are really unable to suckle their own children, and at the period of weaning, sterilised milk is given and this is obtained fresh from the cows on the premises. There are here a clinique for children's ailments and four *couveuses* for prematurely born infants. Though the *couveuses* were bought two years ago they have not often been utilised. Some hundred infants are taken to this place every day. Modern appliances and machinery are used to wash and sterilise the bottles. Each mother receives eight bottles that can hold a quarter of a litre. The milk costs about 2*d.* per litre. Every two months the cows are tested with tuberculin so as to make quite sure that the milk is trustworthy. The straw given to the cows is removed three times a day and the stables are very lofty and airy. Two women sleep on the premises so as to be up betimes in the morning and have the food ready prepared for the infants at the earliest hour. Careful records as to the weight and size of the children are kept and thus useful statistics are beginning to accumulate. The rooms where the parents and children have to wait are lofty and many windows provide an abundance of light and air. This is an institute that English tourists should visit, for there are not many establishments of this sort in England. The local authorities of Battersea, Bradford, St. Helens, Liverpool, and some other places have organised depôts for the sale of sterilised milk to feed infants, but there is not the same care taken in regard to the mothers or the same clinical advantages as are given at Lisbon.

For the amelioration of the food-supply there is at Lisbon a coöperative bakery which had a turnover amounting last year to £20,000. There are 3444 shareholders and each share is worth £10. They sell the bread at the ordinary price of 4*d.* the kilogramme but there is a 3 per cent. bonus on the purchases besides the interest on the capital. More than 17,000 loaves are baked per day. But the bread is kneaded by hand and baked in ovens warmed by burning wood inside. There is nothing modern or even ingenious about this. When the Lisbon coöperative bakery is compared with the marvellous coöperative bakeries dotted about all over Belgium, and especially the parent institutions of Ghent and Brussels, it will be seen that in this respect the Portuguese have still a great deal to learn. Nevertheless, taken altogether, it is very evident that the Portuguese are endeavouring to move forward. In many different directions beneficent institutions have been established that contribute to the social welfare and progress of the people.

THE OUTBREAKS OF PLAGUE IN JEDDAH AND TREBIZOND.

(FROM THE BRITISH DELEGATE ON THE CONSTANTINOPLE BOARD OF HEALTH.)

THE first news of the appearance of plague in Jeddah was received in Constantinople on May 31st. It seems from subsequent reports that the earliest case was seen on the evening of May 29th. The patient was an Abyssinian, aged 30 years, living in a house in the Sabban "hosh." A "hosh" is a collection of buildings around a courtyard, some of which are almost invariably used as stores for all kinds of goods and others as dwelling-places. This patient had been ill for seven days; he was, when seen, comatose and presented three buboes, one in the groin and two large ones in the neck. He was removed to the municipal hospital on May 30th and on the same day a second case was discovered. A microscopical examination of the contents of one of the buboes in the first case was made and it was found that large numbers of bacilli, resembling morphologically the plague bacillus, were present. On May 31st a third case was discovered in the morning; a little later the bodies of two other persons, apparently dead of the disease, were found, and towards evening three more cases were reported, one of which had been found dead. There had thus been eight cases with four deaths up to the evening of May 31st. On June 1st an extraordinary meeting of the Constantinople Board of Health was held and it was decided to impose five days' quarantine, together with disinfection, and application of the regulations for rat destruction, upon arrivals from Jeddah. Special measures were imposed upon *sambouks* (native coasting vessels) leaving that port. Orders were sent to evacuate and to disinfect the rice store, in which it was reported the earliest patients had been employed. It was said that rice from India had been stored in this depôt and some suspicion attached to this rice as having been possibly the means of importing the infection, either in the rice itself or by means of infected rats. It is noteworthy, however, that no dead or plague-infected rats have been found at Jeddah during the course of the outbreak. Instructions were also sent to isolate the sick and those who had been in contact with them, to disinfect thoroughly the houses they had occupied, and to improve as far as possible the sanitary state of the town of Jeddah. The further course of the outbreak has been as follows:—

From	May	29th	to	June	3rd	...	13	cases,	7	deaths.
,,	June	4th	,,	,,	10th	...	8	,,	9	,,
,,	,,	11th	,,	,,	17th	...	7	,,	7	,,
,,	,,	18th	,,	,,	24th	...	11	,,	12	,,
,,	,,	25th	,,	July	1st	...	3	,,	7	,,
,,	July	2nd	,,	,,	8th	...	5	,,	5	,,
,,	,,	9th	,,	,,	15th	...	9	,,	9	,,
,,	,,	16th	,,	,,	22nd	...	11	,,	11	,,
,,	,,	23rd	,,	,,	27th	...	5	,,	5	,,

Since the last-named date no fresh case of the disease has been reported from Jeddah and it is hoped that the epidemic is at an end. There have been in all 72 cases and the same number of deaths. In addition, one fatal case of the disease occurred at Candirah, near Jeddah, and two fatal cases at Mecca. Both the Mecca cases were imported from Jeddah. The first was observed on June 7th in the person of a butcher's assistant who arrived at Mecca that day, was removed to hospital at once, and died the following day. The second was observed on July 10th; the patient had arrived from Jeddah that day and died in hospital the following day. No further case has been reported from Mecca. Should no others occur there the Holy City of the Moslems will have escaped as lightly this time as it did in 1897, 1898, and 1899, when it will be recalled plague made its appearance in Jeddah; in the first two of those years Mecca remained entirely free and in 1899 only two cases, both imported from Jeddah, were observed there.

It will be remarked that every case of plague reported in the present outbreak has been fatal. A considerable proportion have only been discovered after death and there has been much difficulty in finding the sick and removing them to hospital and in carrying out the other measures decreed. The population of Jeddah are for the most part uneducated and fanatical and they dread the measures taken by the sanitary authorities more than they do the disease itself. It is almost certain that many cases occurred which were never made known to the authorities. Ordinary feelings of humanity have yielded to this dread of European interference and dead bodies have been found in the streets, thrown out from unknown houses, in order that the latter might not be invaded by the physician and disinfector. In such circumstances there is a natural doubt as to whether the outbreak is really at an end, and the measures imposed against Jeddah are consequently still in force, although many more than the regulation ten days have elapsed since the last reported case.

The pilgrim season of next year has almost begun. The Moslem month of Redjeb, the first of the six months of pilgrimage, begins this year on August 20th. The Board of Health has already decreed a series of measures intended to prevent the infection attacking pilgrims arriving in the Hedjaz from other parts of the world. These measures (which may, however, be modified now that the outbreak appears to be at an end) may be summarised as follows. The Government has been asked to advance some £T.5000 to cover the cost of the measures and to send six medical men to Jeddah. The board has sent three disinfectors and six sanitary guards to that port, together with a supply of drugs, disinfectants, and plague serum. All pilgrims arriving at Jeddah will, after undergoing quarantine at the Abou-Saad lazaret, land at Ras-el-Assouad, a spot some 10 or 12 miles to the south of Jeddah, and will not communicate with the town, the local authorities being requested to provide camels and other means of transport to enable them to set out for Mecca as soon as they land. Goods will, in like manner, be despatched to the interior by way of Ras-el-Assouad. A sanitary post is to be established either at Haddé or Bahré, both of which are about half way between Jeddah and Mecca; pilgrims will undergo a medical visit here and any sick will be detained. On arriving at Mecca they will be subjected to another medical visit and to medical surveillance for five days "à domicile," so far as that may be practicable. This measure should not be so difficult of application as it appears at first sight, since the majority of pilgrims are lodged in registered lodging-houses. There must, however, be a considerable number of them who do not go to such houses and who sleep in the streets and open places, or in any corner where they can lay their heads. This scheme of measures is largely based on a similar scheme adopted in the three years mentioned above, when Jeddah was the scene of an outbreak such as the present one. Unfortunately it involves the entire avoidance of the town of Jeddah by the thousands of pilgrims from abroad, and as the townspeople of Jeddah largely depend for their existence upon what they are able to make out of these pilgrims there will be strong opposition to the measures upon their part. It will be recalled that such opposition led to serious riots in the years mentioned. It may be hoped, therefore, that the apparent subsidence of plague in Jeddah may prove to be real, and to admit of a modification of the measures in question in order to avoid the repetition of such riots. In the meantime efforts are being made to improve the sanitary state of the town, but upon this matter I shall hope to send you at an early date some further information from personal observations made during a stay in that interesting town.

The outbreak of plague in Trebizond was first made known here on August 8th. The first cases were seen by the health officer of that port on the afternoon of that day. He was asked by the authorities to visit some suspicious cases in the town prison, and he found three prisoners sick of the disease and the body of a fourth already dead. The details of the four cases were as follows:—

Case 1, aged 35 years, had arrived from Constantinople 28 days previously; he was said to have fallen ill on August 7th; the symptoms as described were those of an acute attack of plague, with a right inguinal bubo. He became comatose and died at midday on the 8th. The body presented no abnormal signs save the bubo and some large spots of ecchymosis.

Case 2, aged 22 years, in prison for eight months. He fell ill on the 7th, with the symptoms of plague and several enlarged glands in the left groin.

Case 3, aged 34 years, fell ill on the 6th, with similar symptoms; bubo in the groin of the size of a hen's egg.

Case 4, aged 28 years, also fell ill on the 6th, with almost identical symptoms; there were enlarged glands in the left groin and axilla.

Other cases have since occurred in the same prison and up to August 14th there had been in all eight cases with four deaths. The outbreak has so far been confined to the prison. This is apparently a large building, containing some 700 prisoners, and it is stated that in the room in which the first cases occurred, and which measures only some 60 square metres, no less than 72 prisoners were lodged. It is not easy or pleasant to imagine what the sanitary condition of such an institution must be. The Board of Health has urged the authorities to evacuate the building completely and to disinfect it thoroughly, no half measures being admissible in presence of such a "foyer" of disease. The origin of the infection is entirely unknown and it is remarkable that the disease has made its appearance in a prison. It is, however, stated that a mortality among rats had been observed in the prison for some ten days before any of the prisoners were attacked. No bacteriological inquiry has yet been made, but a bacteriologist has now been sent from Constantinople to make such inquiry. From the details already furnished there seems, however, to be little doubt that the outbreak is one of bubonic plague. So far as is known the nearest places to Trebizond where plague is now prevalent are the Persian province of Seistan on the one hand, and on the other the ports of Alexandria and Port Said.

In addition to the various measures (isolation, disinfection, &c.) that the Government authorities have been urged to take in the prison and town of Trebizond, the Board of Health has imposed a medical visit upon persons leaving the town by sea, a second medical visit, with disinfection and application of the rat-destruction regulations (the whole not to delay the ship more than 48 hours) in the lazaret of Sinope, and, for those passing the Bosphorus, a third medical visit at Kavak, at the northern end of the Bosphorus.

Constantinople, August 16th.

WALES AND WESTERN COUNTIES NOTES.

(FROM OUR OWN CORRESPONDENTS.)

The Rhondda Water-supply.

THE unsatisfactory nature of the water-supply in one portion of the Rhondda valleys has been frequently commented on in THE LANCET. Until quite recently the only cause for complaint arose from the peaty discolouration of the water, and although attempts have been made by the water company to remove this condition they do not appear to have been successful. Five or six years ago the inside of the mains was thoroughly scraped and a large amount of deposit was removed. About the same time a set of mechanical filters was installed. These remedial measures only partially succeeded, and at the last meeting of the urban district council the medical officer of health (Dr. J. D. Jenkins) presented a report on the subject which disclosed a serious situation and such as the council can hardly ignore. The amount of discolouration in the water varies considerably, and although due primarily to the

nature of the gathering ground it is largely influenced by the method and thoroughness of filtration. While the nature of the gathering ground cannot be altered, Dr. Jenkins thinks that much might be done to lessen the discolouration by rejecting the first water after a drought by means of the by-wash. The principal reservoir has a capacity for 200,000,000 gallons and during its formation the peat naturally present in the soil of the upper portion was not, it appears, thoroughly removed. Dr. Jenkins is evidently of opinion that if the mechanical filtration were supplemented by filtration through sand there would be much less cause for complaint. It is unsatisfactory to find that on the occasion of one of his visits to the waterworks the water was being supplied without undergoing any form of filtration at all. The district council ought to have no difficulty in requiring a proper supply to be given, for in the Act of Parliament under which the company secured the right of supply it is provided that the water shall not only be pure and wholesome but that it shall be "efficiently filtered." But since the beginning of the present year a portion of the supply has been affected in another direction. It has been found to have a distinctly plumbo-solvent action. A year ago there was not known to exist in the Rhondda valleys a single case of lead poisoning attributable to water-borne lead, while at the present time there are under observation by the medical men in the district at least a dozen cases, some of them exhibiting severe symptoms of paralysis. The localities principally affected are those in the lower part of the great valley. The quantity of lead present in the water distributed there and which had been in contact for several hours with the lead service pipes varied from 1 to 5·2 parts per million. Early in June the inhabitants were warned by placards to abstain from drinking water after it had stood in the lead service pipe, especially that first drawn in the morning, and were advised to draw off at least a gallon before using a supply for cooking or drinking. This latter suggestion has called forth a protest from the water company on the ground that if it is followed there will be a waste of water.

Schools and Infectious Diseases in Gloucestershire.

In the annual report of the medical officer of health of Gloucestershire Dr. J. Middleton Martin states that the work of district councils in dealing with infectious diseases is increased by the aggregation of children in schools. During epidemics, more especially of diphtheria, the usual public health staff is inadequate to meet the outbreaks if they are to be controlled as it is now known they can be controlled. Emphasis is given to this opinion by an account of two distinct outbreaks of diphtheria which occurred in different parts of the county during 1905, and which were dealt with on different lines. In one outbreak, which occurred in the Thornbury rural district, material from the throats and noses of all the school children—372 in number—was examined bacteriologically, when it was found that in 75 per cent. there was present either the Klebs-Löffler bacillus or a highly suspicious organism closely related to it. In 21 per cent. of the children the bacillus was found in the nose only. The schools were kept open, and during three weeks the throats and noses of all the children were sprayed by the local medical practitioner and the disease was stamped out. The second outbreak was in the Lydney rural district and lasted from the end of 1904 to the beginning of the present year. It was not found possible to carry out the very complete measures which were adopted in the case of the Thornbury outbreak, and the closing of the schools is said to have been quite ineffectual in checking the progress of the disease.

An Unusual Case under the Workmen's Compensation Act.

At the Plymouth county court on August 15th, before his honour Judge Lush-Wilson, K.C., the relatives of a labourer claimed £156 from the proprietor of a quarry at Saltash. Evidence showed that the deceased, who had worked for the defendant for a month, injured his thumb; he remained at home for a week, then resumed his employment, and next day tetanus set in which proved fatal. Medical attention was not procured until tetanus supervened. It was stated that a few days after the accident the deceased had a scuffle with another man when both fell down. His honour, in awarding the relatives £40 compensation, said he held there was sufficient proof that death was the result of the accident.

Falmouth Oysters and Contamination.

Some three or four years ago certain oyster beds at Falmouth were condemned as being contaminated with sewage, and the seizure recently of a large quantity of oysters by the metropolitan authorities has again drawn local attention to the matter. It is only oysters which come from certain areas of the Falmouth district which are contaminated; Helford, St. Mawes, and St. Just areas are perfectly pure, and oysters are sent from there to many parts of the country where they are received without question. The only method of relieving the present state of affairs is to compel all the local authorities whose sewage pollutes the waters and the beds to remove the source of contamination. This is a large undertaking but it will have to be considered.

August 21st.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Condition of Flock Beds.

DURING the last two months Dr. R. M. Buchanan, the bacteriologist to the corporation of Glasgow, has examined nine samples of bed-flock which he received from the sanitary inspector. Experimental tests were also undertaken with new flock beds direct from the warehouse and with flock beds which had been in use for some time. For the latter purpose six houses were visited in the east end of the city. The general result of the investigations has served once more to demonstrate that flock, especially of the cheaper qualities, has a bacterial flora indicating an extreme degree of filthiness.

The Natives of St. Kilda and Vaccination.

The inhabitants of the island of St. Kilda, who for so many months of the year are isolated from the rest of the world, evidently do not appreciate the advantages of vaccination. Dr. Johnston of the Local Government Board visited the island this month with a view to vaccinating the natives and found that the operation was not looked upon with favour. About 60 per cent of the community, however, were successfully vaccinated. Some younger citizens tried to get out of the ordeal by saying that such an operation would disable them for the Fulmac catching season which was near at hand. The able-bodied of those vaccinated are discussing the likelihood of being compensated for loss of time incurred through their compliance. The reason why so many of the inhabitants have not previously been vaccinated is that there is no resident medical man on the island. The last steamer to call at the island for this season leaves at the end of this month, and from that date until the spring of next year there will be no communication between the island and the mainland.

Nairn's New Hospital.

The new Town and County Hospital buildings at Nairn were opened last week by Earl Cawdor. These buildings and site, costing in all £5500, are the munificent gifts of Mr. Alexander Mann of Guayaquil, South America, who is a native of Nairn. The history of the hospital is that as far back as 1842 a scheme was set on foot for providing hospital accommodation for the town and county of Nairn, and in 1846 the hospital was built at a cost of £900. A vast amount of good has been done by this hospital during the past years, but it has not now sufficient accommodation to meet the requirements of the district. In making his gift Mr. Mann has stipulated that his name shall be inscribed nowhere inside the building. At the close of the opening ceremony a message was sent to Mr. Mann by those present expressing their gratitude for his generosity and undertaking that the hospital would be efficiently maintained. Immediately afterwards a three days' bazaar was opened in the public hall in aid of the furnishing and equipment of the new buildings. At the bazaar the total proceeds for the three days amounted to £1450.

The New Laboratories at the University of Glasgow.

The new laboratories in connexion with the chairs of physiology, materia medica, and forensic medicine and public health, which are being erected at a cost of £60,000, are now approaching completion, and it is expected that they will be opened in the spring of next year by the Prince of Wales. The internal arrangement of the building for physiology has been a little delayed pending the appointment of a

new professor to the chair, but now that Professor D. Noel Paton has been appointed his views on the matter will be able to be ascertained and there is not likely to be any further delay. The opening of the new laboratory for natural philosophy has rendered it possible to hold for the first time this summer a practical class in physics for medical students. This class was not made compulsory, but it was found that almost every student who had entered for the lectures also took out the practical class.

August 21st.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Typhoid Fever in Belfast.

AT a meeting of the public health committee of Belfast held on August 16th it was reported, as many of your readers may know, that cases of typhoid fever had occurred in the southern part of the city, and instructions were given for the energetic prosecution of investigations to trace the origin of the disease. The outbreak has occurred in Adelaide Park, Cadogan Park, and the neighbouring residential district for the well to-do classes. It is hoped that the cause of this outbreak, whether milk, water, or defective drains, will be found out promptly, for at present, it will be remembered, Belfast, being without a medical superintendent officer of health, is not in a favourable position to withstand an epidemic.

Fire at the Throne Hospital, Belfast.

On Saturday last, August 18th, a fire, which is believed to have had its origin in a faulty chimney, broke out in the children's wing of the Throne Hospital, the convalescent institution connected with the Royal Victoria Hospital, which is situated about four miles from Belfast. The city fire brigade was at once summoned, while all the children were safely removed. Fortunately, after some hard work by the brigade the risk of the fire destroying the whole building was overcome and the damage was limited to the children's wing. The roof of this was completely destroyed, while the fabric was very much injured by fire, smoke, and water. Thanks to the efforts of the salvage corps the beds, bedding, and other articles of furniture were saved. The little patients, who were transferred to another portion of the building, have proved to be none the worse for their adventure. The loss is covered to a certain extent by insurance.

Tuberculosis in Pork.

A meeting of the city council of Belfast in committee was held on Monday last, August 20th, to consider the question of dealing with tuberculosis in pork. On July 28th the market committee passed, after long consideration, the following proposition:—

> That in all well-nourished carcasses of pigs, where the tuberculosis is strictly confined to the glands of the neck, the head only, or such portion as is affected by the disease, shall be destroyed, the remainder of the carcass being handed back to the owner, and that in the case of all carcasses showing unmistakeable evidence of the disease having become generalised—i.e., two or more organs affected—the whole of every such carcass shall be destroyed.

When the matter came before the city council at the beginning of August it was decided to refer the subject to the market committee, which, after careful consideration of all the facts, reaffirmed its resolution. On August 20th this was reported to the council in committee, called specially to receive the market committee's report, and after considerable discussion the market committee's resolution was adopted by a majority of two. An amendment to adjourn the matter for a month for the market committee to obtain expert evidence on the whole question in the interval was lost.

The late Mr. G. L. B. Stoney, L.R.C.P., L.R.C.S. Irel.

Mr. Stoney died at his residence, Lucan, co. Dublin, on August 8th. For the last 30 years he was well known and highly esteemed in the district, while he made many friends among the visitors who stay at the Hydropathic Hotel and drink the sulphur spa water. He was the author of the "Report on the Lucan Spas, and Lucan as a Health Resort," and did a great deal to make the place popular. He was medical officer of the Lucan Dispensary district.

August 21st.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Alcoholism in France.

IF we may judge of the progress of alcoholism in France by the increase in the number of public-houses the result gives very little encouragement to those who are striving against the alcohol plague. As a matter of fact, the number of public-houses continues to increase and alcoholism increases *pari passu*. In 1904 there were 468,434 places for the sale of alcohol open. In 1905 the number had increased to 473,593.

A Curative Product Derived from Tuberculinine.

At a meeting of the Academy of Sciences held on August 6th M. Baudran read a paper wherein he said that being convinced that the bacillus tuberculosis contains a toxic body of alkaloidal nature, to which he has given the name tuberculinine, he had been enabled to isolate this body in a crystalline state and from it to obtain a substance possessing curative properties. He treated tuberculinine with permanganate of calcium and then injected it into healthy guinea-pigs in doses of 0·0008 of a gramme. The guinea-pigs died within a period of from eight to 15 days after the injection. M. Baudran was thus enabled to obtain an antitoxin which injected in doses of one cubic centimetre as a preventive 12 hours before an injection of tuberculinine in healthy guinea-pigs enabled them to receive on the following day a fatal dose of tuberculinine without dying. With regard to the curative properties of this substance encouraging experiments had been made upon both guinea-pigs and bovine animals. Moreover, M. Baudran had observed upon himself that subcutaneous injections of the antitoxin were painless and did not cause any rise of temperature or any other trouble even when the injections were continued for several weeks.

The Paris Hospitals.

For the last year many works have been undertaken at the Paris hospitals. In two of the hospitals these works have come to an end and the new buildings are in working order. At the Lariboisière Hospital great enlargements have been carried out. A new block has been built, altogether reserved for medical and surgical consultation. New operation theatres have been built, all the kitchens have been reconstructed, and a model laundry has also been put up. In the new consulting rooms the angles are all rounded off; the floor is tiled and the walls are varnished. Besides rooms for ordinary medical and surgical work special departments have been erected for electro-therapy, oto-rhino-laryngology, and ophthalmology. In the laundry the dirty linen is disinfected, washed, dried, and done up mechanically. At the St. Antoine Hospital the work carried out has cost about 2,000,000 francs and the hospital will in future be able to provide for nearly 1000 patients in lieu of 800 as formerly. Large consulting rooms have been built upon a new style. The patients undress in a separate room before going into the physician's room and they are examined separately. A magnificent building has been put up for the staff. Finally, the Andral Hospital having been done away with has been replaced by Bastion 27, which has been arranged as an ordinary hospital.

The Expenses of Justice.

The Director of Criminal Prosecutions desiring to diminish the expenses of legal proceedings has just sent out a circular to *procureurs généraux* pointing out various petty economies which they could carry out. Naturally, most of these small economies are directed against medical men. As it is, the fees paid to medical men for the loss of their time are laughable, so much so that in numerous small towns there is great difficulty in finding any medical man who will take up the work of a medical expert; and now, apparently, even the small sums paid to such experts are going to be diminished. In cases of misdemeanour, for instance, the fee for a medical report will only be 5 francs. Experts in mental diseases cannot be summoned unless there is some presumptive evidence of intellectual trouble or if they are demanded by counsel, who must justify the necessity of calling in such evidence. Laboratory expenses for chemical analysis are also to be reduced as much as possible. The circular puts forward a desire that in workmen's compensation cases a maximum sum should be laid down for a fee in

such cases as have no exceptional character. In trials carried out *in formâ pauperis* the circular requests that all medical men in place of coming themselves to court to give their report should send this by post to the president of the court. This measure is not a very happily conceived one, for often it happens that objection is taken to the evidence of the medical men and in this case there will be no opportunity of hearing their answers to such objections.

August 20th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Serum Treatment of Puerperal Fever.

Professor Martin of Greifswald, writing to the *Berliner Klinische Wochenschrift*, says that of the two modern principles of treating puerperal fever—namely, by surgical methods and by injections of antitoxin—the former is available only in clinics and hospitals, whilst the latter may be carried out by any practitioner. Opinions, however, differ greatly as to the efficacy of serum treatment owing to the want of a satisfactory system of comparing cases. Professor Martin has endeavoured to arrive at a definite result by tabulating the incidence of pyrexia in puerperal patients according as they were treated with or without serum. He said that since June 1st, 1905, all cases of puerperal fever under his care have been treated by antitoxin and he compares the cases which occurred from that date till June 1st, 1906, with the corresponding numbers of the previous year when serum treatment was not yet in use. In the administration of the antitoxin 20 cubic centimetres were injected when the rectal temperature was higher than 38·5° C.; if the temperature was over 38° C. on the following day a second injection and perhaps even a third injection were given. When the temperature did not fall another series of injections was begun on the sixth day. The statistical tables compiled by Professor Martin show that temperatures from 38·5° to 38·9° were attained in 25·6 per cent. of the cases treated without serum and in 28 per cent. of those treated with serum; temperatures from 39° to 39·4° were attained in 23 per cent. of those treated without serum and in 32 per cent. of those treated with serum; temperatures from 39·5° to 39 9° were attained in 20·5 per cent. of those treated without serum and in 24 per cent. of those treated with serum; temperatures from 40° to 40·4° were attained in 23·5 per cent. of those treated without serum and in 8 per cent. of those treated with serum; and temperatures from 40·5° to 41° were attained in 7·6 per cent. of those treated without serum and 8 per cent. of those treated with serum. Temperatures over 40°, therefore, occurred in 31 per cent. of the cases treated without serum but in only 16 per cent. of those treated with it; in the latter the pyrexia was also of shorter duration. Professor Martin therefore recommends that serum treatment should be employed in every case.

The Comparative Frequency of Appendicitis in Men and in Women.

The above question is discussed by Dr. Karrenstein of Altona in the *Deutsche Medizinische Wochenschrift*. In the surgical text-books appendicitis is said to be much more frequent in the male than in the female sex, the proportion varying according to the different statistics from 74 to 53 per cent. for males. Dr. Karrenstein, however, maintains that false conclusions have been drawn from the facts. As the statistics are based on hospital cases and as men are admitted to hospitals in much greater numbers than women it is obvious that more men must be treated for appendicitis than women. It was not the absolute number but the frequency of appendicitis in each 1000 men and 1000 women that should be compared. When this was done it was found that in Berlin the numbers of men and women suffering from appendicitis were nearly equal and that in 1899 even more women than men were received, the proportions being 2·99 per 1000 men and 4·20 per 1000 women. In Hamburg a considerable and permanent preponderance of appendicitis in the female sex was found to exist.

The University of Greifswald.

The University of Greifswald in Pomerania lately celebrated its 450th anniversary with great display. Prince August Wilhelm, representing the Emperor, the Minister of Education, and many representatives of the authorities attended the proceedings, which began with Divine service in the cathedral. At a formal meeting of the four faculties, presided over by the rector, Professor Bonet, and in the presence of many official personages and visitors, honorary degrees were conferred on several men of science. The recipients of the honorary degree of M.D. included Professor William Keen of Philadelphia, Professor Roux of the Pasteur Institute at Paris, and Professor Snellen of Utrecht. Considerable sums have been placed at the disposal of the University by some wealthy families of Pomerania for the purpose of providing the university clinics with means for scientific research and for the reception of indigent patients. A special number, consisting exclusively of articles contributed by members of the Greifswald Medical Faculty, has been issued by the *Deutsche Medizinische Wochenschrift*.

Practical Joking by Students.

A paragraph was lately inserted in some daily newspapers to the effect that the medical students of the University of Göttingen had passed a resolution condemning vivisection. It was said in the resolution that vivisection was censurable from the ethical and moral point of view, that it demoralised the teachers as well as the students, and that the students assembled in meeting declined to attend the lectures on physiology and pharmacology as long as experiments on animals were performed. This report caused a great sensation and received the hearty approval of the adherents of "natural" medicine, antivivisectionists, and so on, but their joy was short-lived, for it soon became known that a party of medical students, exhilarated by good German beer, had constituted themselves an antivivisectionists' committee, and that the report of the proceedings at the alleged meeting was the product of their imagination.

August 20th.

CONSTANTINOPLE.

(FROM OUR OWN CORRESPONDENT.)

The Recent Illness of the Sultan.

ALL sorts of alarming rumours concerning the recent illness of the Sultan have been circulating in the Ottoman metropolis and doubtless have found their counterpart elsewhere. Last Friday, when Abdul Hamid did not appear to perform the traditional religious ceremony of the so-called Selamlik, it was said that he was already dead, some affirming their knowledge that he was poisoned, having fallen a victim to a palace revolution. The cause of these extraordinary false rumours is the great secrecy which surrounds all things concerning Yildiz-Kiosk, and especially the person of the Sultan. The fact that the Padishah did not attend the Friday Selamlik ceremony was certainly an unusual occurrence, it being the first time during the long reign of Abdul Hamid that this religious military pageant was dispensed with, and no explanation for the departure was too violent for the imagination. The facts concerning the Sultan's illness are as follows and I believe that I have gathered them from trustworthy sources. Abdul Hamid suffers from a chronic enlargement of the prostate gland with all the consequent train of symptoms associated with this malady. As he is over 60 years of age it is not surprising that sometimes these symptoms become more acute. The first manifestations of the condition began to trouble the Sultan about ten years ago, when a German surgeon who was called in recommended operative treatment. The Sultan, however, declined to submit to operation and it is very doubtful if he would be of a different opinion now if Professor Bergman comes to Constantinople, as is stated to be probable. In the meantime the Sultan is undoubtedly better and the chief chamberlain has made a formal announcement that he has *completely recovered* (the italics are mine).

The Civil Medical School at Damascus.

This school was founded three years ago and is doing good work. It contains at present 102 students of whom more than half are studying the practice of medicine. The remainder devote their time particularly to chemistry. The last summer examinations have been brought to a close some days ago. It is intended to enlarge the buildings of the school as the number of students is steadily increasing.

A Laboratory of Chemical Analysis.

It is intended to erect at the prefecture of the capital

a laboratory of chemical analysis. The cost has been estimated to amount to 400 Turkish liras. Tenders will be invited for the supply of the necessary appliances.

August 15th.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

Five-Year Medical Course at McGill University.

THE corporation of McGill University of Montreal has approved of a resolution sent on from the medical faculty thereof advising that the present four-year medical course should be extended to one of five years. It is likely that the change will come into effect in the session of 1907–08. The University of Toronto will probably soon join in making the five-year course compulsory, and the University of Manitoba may do the same. The Medical Council of the Ontario College of Physicians and Surgeons has been requiring a five-year course for several years past.

Tuberculosis in British Columbia.

Recently sites have been inspected near Kamloops for the purposes of a consumption sanatorium, in which inspection the provincial officer of health, Dr. C. J. Fagan, Victoria, took a prominent part. The Anti-Tuberculosis Association of British Columbia has also recently made a personal appeal to the residents of the province. In a letter bringing the matter to their attention it is stated that 12,000 die annually in Canada from tuberculosis and over 200 in British Columbia. It is estimated that there are 60,000 invalids in Canada from this disease, and that 1000 of them are in British Columbia. $100,000 are required for the purposes of the above institution.

Annual Meeting of the Ontario Medical Council.

At the annual session of the Ontario Medical Council, held in Toronto in July, the following officers were elected for the ensuing year:—President: Dr. W. H. Moorhouse, London, Ontario. Vice-President: Dr. Spankie, Wolfe Island. Registrar: Hon. Dr. R. A. Pyne, M.P.P., Toronto. Treasurer: Dr. H. Wilberforce Aikins, Toronto. A practitioner of the province had his name erased from the Register for unprofessional conduct, his offence consisting in advertising that he had a remedy to cure influenza in two hours, which would also cure pneumonia and other diseases. The lay press took great umbrage over this gentleman's case, urging that he had been unduly dealt with by the council, and deprived of earning his livelihood on a trivial charge. The president of the council has made a communication justifying the council in protecting the public from fraud.

Race Suicide in Ontario.

According to the recent report of the registrar-general for Ontario for the year 1904, when there was a population in Ontario of 2,203,768, the births numbered 50,265, which included 1690 still-births. The birth-rate was therefore 22·8 per 1000, an increase of 0·7 over 1903. Still-births are steadily growing in number in Ontario, as the following will show: in 1897 there were 435; 1898, 532; 1899, 419; 1900, 578; 1901, 780; 1902, 823; 1903, 933; and 1904, 1690. In the face of the fact that all the still-births are not registered the many instances of infanticide unearthed by the police of Ontario during the last two or three years lead to the suspicion on the part of the provincial authorities that there has been a sort of campaign of murder, and the matter is now receiving investigation at the hands of the law officers of the province. The number of children born out of wedlock in 1904 was 798. There were fewer marriages than in the previous year, the total number being 19,789. The report, which deals so strongly with infantile mortality, also referred to the deaths in the province in 1904, which numbered 30,920, a rate of 14·1 per 1000.

Reorganisation of the Ontario Board of Health.

Owing to the recent deaths of two members of the Ontario Board of Health, no appointments having been made in their stead by the Government, it is understood that reorganisation is to take place. The board as at present constituted is chosen from physicians in different sections of the province, and attached to them are a secretary, a bacteriologist, a medical inspector, a provincial chemist, and a provincial analyst. The proposition is to constitute the board, with the present secretary as chairman, from the bacteriologist, the medical inspector, the provincial chemist, and provincial analyst, whilst an advisory council, consisting of medical men in various parts of the province, would be called together in grave cases of danger to the health of the province.

British Columbia Canned Salmon.

Owing to the recent attempt to slander British Columbia salmon in the English market Dr. C. J. Fagan, has recently made a tour of the canneries of the Fraser River to study conditions during the packing season. His report sets at rest the slightest doubt as to the cleanliness of the operations. He says that of 25 canneries on the river every one is strictly complying with the regulations of the Board of Health of British Columbia. There is no offal in the buildings and rules of cleanliness are rigidly enforced.

The Medical Building of Queen's University destroyed by Fire.

It has already been reported in English papers that on the morning of July 4th Queen's Medical College building at Kingston, Ontario, was entirely destroyed by fire. The total financial loss is now found to be about $75,000. Only $22,000 insurance was carried on the building. All that was saved was the secretary-treasurer's books. Valuable medical apparatus and specimens which cannot be replaced became a prey to the flames. The provincial (eastern) bacteriological and public health laboratories were also completely wiped out. It is only a short time ago that an extra storey was added at a cost of $11,000 and plans were being prepared for the complete renovation of the building. The work of reconstruction is already well under way and the College will be rebuilt in time for the coming session in the fall.

Death of Dr. Robert Craik.

There died recently in Montreal one of the noted members of the medical profession in Canada, Dr. Robert Craik, formerly dean of the medical faculty of McGill University. He was born on April 22nd, 1829, and graduated from McGill with high honours in 1854. He immediately became house surgeon to the General Hospital in that city, and had charge of the city arrangements against the cholera epidemic which took place in Montreal at that time. He was first appointed to the McGill faculty in 1856, and became dean in 1889, holding the post for 11 years, when he was succeeded by Dr. Roddick. Within the last week the board of governors of both the General Hospital and McGill University placed resolutions on their books speaking in the highest terms of praise of the work of Dr. Craik.

Toronto, August 13th.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

Bubonic Plague.

BUBONIC plague continues in Sydney and three fatal cases of the pneumonic form have occurred as well as several non-fatal cases of the ordinary form. The "contacts," 24 in number, removed to the quarantine station from the pneumonic cases fortunately have not developed the disease and have been released. Plague-infected rats and mice continue to be caught about the wharves in Darling harbour. The "contacts" from plague cases have all been treated with preventive serum from the Lister Institute. The first case of the pneumonic form worked on a coastal steamer berthed at wharves where infection has been. This is the first time the pneumonic form has occurred in New South Wales, but a small outbreak of it occurred at Bundaberg in Queensland about two years ago. On the arrival of the P. and O. mail steamer *Britannia* at Adelaide it was found that a member of the crew was suffering from bubonic plague. The passengers for Adelaide were landed and placed in quarantine for five days and the patient was also landed.

Proposed Destruction of Rabbits by Disease.

Dr. Danysz, who has come to Australia for the purpose of trying to destroy the rabbits by inoculating them with the microbe of hæmorrhagic septicæmia, has not met with a very favourable reception. The Federal Government has issued a proclamation prohibiting the importation of the microbes except under certain conditions—viz., that the packages containing them be handed unopened to Dr. F. Tidswell, the State bacteriologist of New South Wales, and

retained by him unused until the Minister gives permission to use them. Under the Noxious Microbes Act of 1900 of New South Wales the State Government will have also to pass a regulation sanctioning experiments before anything can be done. In the meantime only laboratory experiments will be carried on.

The Health of Melbourne.

The annual report of the health committee submitted to the city council of Melbourne showed that the death-rate, 12·5 per 1000, was the lowest on record, while that for the last period of five years was also the lowest for any quinquennial period, viz., 13·96. In a population of 98,000 persons there had been only two deaths from typhoid fever, and while the deaths from this disease in the five years ended 1890 were 250, in the last five years they were only 30. The deaths from diphtheria, comparing the same periods, had fallen from 165 to 30, while those from tuberculosis had fallen from 207 in 1891 to 98 in 1905. The improvement was attributed to the extension of the sewerage system. A steady war had been waged against rats and 90,000 had been destroyed. The experiment of appointing a female sanitary inspector had proved a distinct success. The committee advised the appointment of an assistant health officer at a salary of £300 a year, his whole time to be given to the service of the corporation. The present health officer, Dr. Jamieson, is paid £500 a year and does not give his whole time. The proposal was opposed in the council and its consideration was postponed for two months. The objectors considered that either separate officers should be appointed for the different districts or that the present health officer should give his whole time to the duties at a higher salary. Referring to the diminution in tuberculosis in Melbourne during the last ten years Dr. Jamieson stated that much of it must be credited to improved drainage and the results of legislation for the improvement of conditions in factories and shops, but also a great deal to the steady work carried on by the council in the inspection and condemnation of dwellings found to be unfit for occupation. Up to the end of 1905 no less than 2100 condemnation orders had been issued. All cases of known consumption are now kept under supervision by means of the system of notification in force and advice is given by circular and verbally. In case of death or removal prompt steps are taken for the disinfection of occupied rooms. Nevertheless, notification and supervision have led to the infliction of undoubted hardships in individual cases and an obligation clearly rests on the public if, for its own protection, it insists upon these precautions being carried out to make ampler provision for the treatment of cases, especially of advanced cases, who will not be received into boarding houses, hotels, or even often into public hospitals.

Public Health Act, New South Wales: Suggested Amendments.

The Board of Public Health of New South Wales has drawn the attention of the Premier to the great need of amendment of the Public Health Act which had become apparent to the Board during its administration.

Amendment of the Medical Act of Victoria.

Among the "slaughtered innocents" of last session of the State Parliament of Victoria was a Bill to amend the Medical Practitioners Act. On the list of Bills to be introduced by the Government this session is one "to amend the law relating to medical practitioners." It is understood that it will not be so drastic as the previous measure but will increase the course of necessary medical study from three to five years. It will also give power, not at present existing, to strike names off the register.

The University of Sydney.

The Faculty of Medicine of the University of Sydney has recommended the adoption of by-laws and regulations for a diploma of public health which will testify to the candidate's proficiency in all branches of study, scientific and practical, necessary for the proper performance of the duties of a health officer. The examination will be in two parts: (1) the general principles of sanitary science; and (2) State medicine and the applications of pathology and sanitary science to public health. The recommendations of the Faculty were adopted by the Senate, and the thanks of the Senate were transmitted to Dr. J. Ashburton Thompson (President of the Board of Health), Dr. F. Tidswell (microbiologist to the Board), and Dr. E. S. Stokes (medical officer of the Water and Sewerage Board), for assistance in drawing up the scheme. The Senate resolved "to advise the Bachelors of Dental Surgery to discontinue the use of the title of doctor" and "to communicate with the Government, urging it to immediately introduce legislation regulating the registration and use of foreign degrees of doctors of dental surgery, mechanical surgery, or the like." Dr. A. E. Mills was appointed medical tutor in place of Dr. G. E. Rennie resigned, and Dr. F. P. Sandes surgical tutor in place of Dr. J. Morton, resigned. The following examiners were appointed: Medicine, Dr. J. Macdonald Gill; clinical medicine, Dr. E. J. Jenkins; surgery, Dr. Charles MacLaurin; clinical surgery, Dr. T. H. Fiaschi; midwifery, Dr. S. H. MacCulloch; gynæcology, Dr. Fourness Barrington; medical jurisprudence and public health, Dr. R. H. Todd and Dr. G. Armstrong; psychological medicine, Dr. Eric Sinclair; and ophthalmic medicine and surgery, Dr. W. Odillo Maher.

Inebriety

The Chief Secretary of New South Wales has personally visited the buildings erected on Rabbit Island in the Hawkesbury river for the treatment of inebriates. He expressed satisfaction with the site and buildings and will bring the matter before the Cabinet.—At a meeting held at the Melburne town hall an association was formed with the following objects: (1) to make public the provisions of the law with respect to drunkenness; (2) to collect and publish information from time to time about the treatment of inebriety and laws relating thereto in other countries; (3) to aid and encourage the establishment of retreats, both public and private, in Victoria, but the association shall not itself establish or conduct any inebriate retreat; (4) to watch the administration of the Inebriates Act in Victoria; and (5) to seek such amendments of the Inebriates Act as experience shows ought to be made.—A Royal Commission was appointed in South Australia some time ago to investigate the treatment of inebriates. It has reported that places of detention should be established for drunkards and that a medical officer should be appointed to prosecute inquiries into the practice of hypnotism with a view to its application in such institutions.

July 20th.

NEW ZEALAND.

(FROM OUR OWN CORRESPONDENT.)

Action for the Recovery of Medical Fees.

A CASE that has excited considerable comment lately has just been settled. The plaintiff, Dr. Borghetti, sued the father of a patient for the sum of his fees for attendance. The defence was that the plaintiff had agreed with the mother to compound for a less sum than the amount he was now asking. This Dr. Borghetti denied, and I am glad to say that the magistrate has upheld the claim. Dr. Borghetti's counsel in opening the case said that his client devoted himself entirely to the treatment of diseases of the eye and was not a general practitioner. On Jan. 27th last the defendant's young son was taken by two of his brothers to Dr. Borghetti's residence suffering from an injury to his right eye caused by a blow from a piece of crockery. An operation was performed under chloroform which was administered by Dr. Young; other operations, including two of a major character, were subsequently performed, and the lad remained under Dr. Borghetti's care until May 7th. At one time, with the consent of the defendant, there was a consultation between Dr. Martin, Dr. Young, Dr. Mackenzie, and Dr. Borghetti as unsatisfactory conditions had made their appearance. Two of the medical men were in favour of excision of the eyeball but the other agreed with the plaintiff in believing that there was a chance of a good result being obtained without this extreme step being taken. The relatives of the lad were extremely anxious that the eye should be saved. The plaintiff, although he recognised the risk he was running by not removing the eyeball, decided to take that risk and to adopt the other form of treatment, which he did with success. But when his account was sent to the defendant the latter declined to pay it and tendered a smaller sum which the plaintiff refused to accept. Thereupon the defendant took the patient from under his charge and called in another medical man,

who had been treating the case ever since. It was submitted that the plaintiff's charges were well within what was regarded as the reasonable scale. Judging from the number of medical witnesses called in the case it would seem that although the defence relied upon the alleged agreement between Dr. Borghetti and the patient's mother a suggestion of improper treatment was likely to be made. The magistrate, in giving his decision in favour of the plaintiff, stated that the operations had been skilfully performed and that the fees charged were moderate.

The New Zealand Meat Trade.

The recent disclosures with regard to the conditions under which the export trade of meat is conducted in America have, it appears, drawn attention to the methods of inspection and surveillance which are exercised over such matters in this colony and the Commonwealth of Australia. This, I am certain, can only tend to the benefit of New Zealand. There is no country in the world where greater care and more scientific skill are employed in the inspection of meat and butter than obtain in this colony. Every carcass is examined by a properly qualified veterinary surgeon and must bear his stamp before the meat can leave the factory. There is every inducement to be honest and none to act otherwise, as compensation is paid to the owners of all condemned stock. At most of the stock sales an inspector is present, but it is upon the post-mortem examination that the certificate depends. Attached to all the meat-exporting companies' works is a Government veterinarian whose sole duty is to examine each animal as it is killed.

Various Items of News.

The Government of New Zealand has invited the various health officers of the Commonwealth to hold their projected conference on inter-State and inter-Colonial quarantine in Christchurch during the time the exhibition is open.—There has been a very regrettable falling off in the number of children vaccinated during the last year. Of those born during that period only about 10 per cent. have been protected. Only the presence of a case of small-pox within the colony will serve to bring the people to a proper sense of the danger.—The campaign against tuberculosis proceeds amain. The hospital boards throughout the colony are gradually seeing the necessity of putting up open-air shelters for receiving not only the curable cases but also that greatest of menaces to the commonweal—the indigent incurable. The latest to undertake this good work is the Thames Hospital Board. The district to which this board ministers is mainly devoted to gold-mining and in consequence there are a great number of men suffering from fibroid tuberculosis and other lung troubles.—A very exhaustive Food and Drugs Bill is to form one of the measures to be dealt with by Parliament next session.

Wellington, July 18th.

Medical News.

FOREIGN UNIVERSITY INTELLIGENCE.—*Berlin:* Dr. Karl Kisskalt has been recognised as *privat-docent* of Hygiene.—*Bologna:* Dr. Carlo Comba has been appointed Extraordinary Professor of Children's Diseases.—*Cracow:* Dr. Valerian Jaworski has been promoted to the chair of Clinical Medicine in succession to the late Dr. Korczynski. Dr. Franz Krzysztalowicz, *privat-docent* of Dermatology and Syphilis, has been granted the rank of Extraordinary Professor.—*Gratz:* The rank of Extraordinary Professor has been granted to Dr. Theodor Pfeiffer, *privat-docent* of Internal Medicine.—*Greifswald:* Dr. Karl Ritter, *privat-docent* of Surgery; Dr. Philipp Jung, *privat-docent* of Midwifery and Gynæcology; and Dr. Hermann Schroeder, *privat-docent* of Odontology, have been granted the title of Professor; and Dr. Ernst Schultze, Extraordinary Professor in the Medical Faculty, has been promoted to Ordinary Professor.—*Heidelberg:* Dr. Sarwey of Tübingen has been appointed to the chair of Midwifery and Gynæcology in succession to Dr. Schatz. Dr. Narath of Utrecht has been appointed Professor of Clinical Surgery in succession to Dr. Czerny, resigned.—*Konigsberg:* Dr. Wrede has been recognised as *privat-docent* of Surgery.—*Marburg:* Dr. H. Vogt has been recognised as *privat-docent* of Internal Medicine.—*Munich:* Dr. Richard Trommsdorff has been recognised as *privat docent* of Hygiene.—*Naples:* Dr. Rocco Caminiti has been recognised as *privat-docent* of External Pathology.—*Odessa:* Dr. N. Gamaleïa has been recognised as *privat-docent* of Bacteriology.—*Padua:* Dr. Giuseppe Favaro has been recognised as *privat-docent* of Anatomy.—*Pavia:* Dr. Umberto Mantegazza has been appointed Professor of Dermatology and Syphiligraphy.—*Rome:* Dr. Giovanni Loriga has been recognised as *privat-docent* of Hygiene.—*Strasburg:* Dr. Ernst Münch has been granted the title of Professor.—*Tübingen:* Dr. Curschmann has been recognised as *privat-docent* of Internal Medicine; Dr. Bonhoeffer of Breslau has been offered the post of Director of the Clinic of Mental Diseases; and Dr. Conrad Sick has been recognised as *privat-docent* of Internal Medicine.—*Zürich:* Dr. H. Bluntschli has been recognised as *privat-docent* of Pathological Anatomy.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Castiaux, professor of forensic medicine in the University of Lille.—Dr. A. Vincent, formerly professor of hygiene in the University of Geneva, and Vice-President of the International Conference on the Revision of the Geneva Convention.—Dr. A. Kliarevski, formerly professor of medical physics in the University of Kieff.—Dr. A. Peride, professor of anatomy in the University of Jassy.—Dr. W. D. Bullard, assistant professor of surgery in the New York Post-Graduate School.

SOCIETY OF APOTHECARIES OF LONDON.—At a meeting of the Court of Assistants held at the Society's Hall, Blackfriars, on August 14th, Mr. E. Parker Young, M.R.C.S. Eng., L.S.A., was chosen as Master, and Mr. George Wilks, M.B., M.R.C.S. Eng., L.S.A., and Mr. F. Gordon Brown, M.R.C.S. Eng., L.S.A., surgeon to the City of London police, were elected respectively as Senior and Junior Wardens for the ensuing year. The customary votes of thanks were given to the out-going Master, Surgeon-General J. H. Jefficoat, and the Wardens. The court unanimously resolved that the Freedom of the Society should be conferred upon Alderman T. B. Crosby.

COOKERY AND FOOD EXHIBITION.—The Seventeenth Universal Cookery and Food Exhibition is to be held at the Royal Horticultural Hall, Vincent-square, Westminster, from Nov. 27th to Dec. 1st. The exhibition is under the immediate patronage of Her Majesty the Queen and the exhibits are divided into 13 sections. Among these sections are those dealing with foods and food products, elementary cookery as taught in schools, household cookery, invalid cookery, navy and army cookery, a section dealing with bread, and a currant cookery competition. In the elementary cookery section there will be a series of children's competitions open to pupils attending cookery classes in elementary schools, and the competition will consist of suitable dishes for artisans and other simple households. Section 13 consists of competitions to be held in the model kitchen. There are to be competitions in grilling, cooking potatoes, making salads, and making omelettes, but we regret to see no competition for the boiling of plain rice. Plain boiled rice is an excellent substitute for other vegetables with ordinary meat but it is exceedingly rare to get it really well cooked, and we hope that the committee will see its way to adding this competition to those already offered.

THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE.—His Majesty the King of the Belgians has repeatedly expressed his appreciation of the work done by the Liverpool School of Tropical Medicine for the improvement of health in the tropics. He has especially taken a deep interest in the investigations into sleeping sickness which the school carried out in the Congo Free State for over three years, when the late Dr. J. E. Dutton so lamentably lost his life owing to contracting a very dangerous disease in the investigation of its causes. The school has continued without intermission to prosecute its researches into sleeping sickness and other tropical diseases and His Majesty has kindly invited the chairman, Sir Alfred Jones, K.C.M.G., to present to him at a luncheon at the Palace at Brussels the leading workers of the school on Thursday next. The professor of tropical medicine, the chairman of the professional committee, the Walter Myers lecturer, the director of tropical research at the laboratories at Runcorn, the dean of the school, and several others will, it is hoped, be present. In view of the generous financial support that the King has already given to the school this further courteous token of

recognition of the work of the school and especially of the young men of science who risk their lives for humanity is much appreciated and the interview will stimulate still further the energies of the school.

NORTH DEVON INFIRMARY, BARNSTAPLE.—The recent appeal made by Lord Fortescue (Lord Lieutenant of Devon) on behalf of the £4000 required for the renovation of the North Devon Infirmary, Barnstaple, has been very satisfactory and it is now assured that the sum required will be raised.

BRISTOL ROYAL INFIRMARY.—The half-yearly meeting of the governors of this institution was held on August 13th under the presidency of Sir George White. The medical report stated that for the six months ended June 30th last the in-patients numbered 1755, against 1733 for the corresponding period of 1905. 19,598 out-patients were treated, compared with 17,315 for the first half year of 1905. The financial statement showed that the income for the half year was £9346 and the expenditure £9334, leaving a favourable balance of £12. Sir George White alluded to the plans which have been made for the erection of a new out-patient department on a suitable site facing the infirmary. The chairman added that £46,099 had been received towards the "£50,000 Fund" which was required for the purpose of improvements in the institution and appealed to the citizens of Bristol to raise the deficiency of £3901 which is still required.

DONATIONS AND BEQUESTS.—By the will of Mr. W. Rae, of Northampton, L.R.C.P. Edin., M.R.C.S. Eng., £5000 are left to Northampton Town and County Institute for Trained Nurses; £2000 to Northampton County Hospital; £500 each to Northampton Royal Victoria Dispensary and Weston Favell Convalescent Home; £250 each to Northampton Institute for the Blind, St. John Ambulance Association, and Good Samaritan Society; and the residue of his estate, probably about £12 000, to the Institute for Trained Nurses.—A donation of £1000 has been received from Lord Howard de Walden for the emergency fund of Charing Cross Hospital.—The executors of the late Mrs. Hannah Finnie have contributed £1000 to the Royal National Hospital for Consumption at Ventnor for the endowment of a bed to be named "The Hannah Finnie Memorial"; and the Royal Dental Hospital of London, Leicester-square, has received £500 from the executors, with the stipulation that the amount be invested and the income therefrom applied for the objects of the hospital.

DOLGELLY ISOLATION HOSPITAL.—The question of erecting an isolation hospital was further considered by the Dolgelly urban and rural district councils on August 17th and 18th. At the former meeting a letter was read from Mrs. Vaughan who had offered three months ago to provide a site for the purpose, stating that she intended her free gift for the benefit of Dolgelly and the immediate districts. After a long discussion the urban council decided by a majority to defer the matter pending a reply from the rural council which had previously agreed to bear a proportion of the cost. At the meeting of the rural council letters were read from almost all the parishes in the area protesting against the expenditure, the general opinion being that the hospital would be of no benefit to them and that the rates were burdensome. The rural council unanimously agreed to rescind the previous resolution to become responsible for part of the cost and resolved that no further steps should be taken in the matter. While all the members of the urban council are in favour of the hospital, the erection of which has been strongly urged upon them by the medical officer (Dr. Hugh Jones), it appears probable that the matter will be dropped now. The scarlet fever epidemic has abated.

THE PRESERVATION OF WOOD FROM WHITE ANTS.—In *Engineering* of August 17th is an interesting note upon a new process for the preservation of wood from white ants. It is well known what damage these insects do to woodwork in the tropics and in many hospital buildings their ravages have been extremely annoying. The process which *Engineering* describes consists of impregnating the timber with a saccharine solution, to which is added a small portion of a metallic salt, and an illustration which is published in the articles to which we refer shows two pieces of ordinary yellow deal, one of which had been treated and the other of which had not been so. These two pieces had been bolted together and placed by the curator of the Government Botanical Gardens at Singapore in a position where there were many white ants. The termites attacked the non-treated piece and very nearly destroyed it altogether, while the treated piece remained entirely unaffected. The process is carried out by the Powell Wood Process Syndicate, Limited, 28, Fleet-street, London, E.C. If we may judge from the illustration given by *Engineering* the process should be of great value where any wooden structure has to be used in a country infested with white ants.

BOOKS, ETC., RECEIVED.

BERGMANN, J. F., Wiesbaden.

Über die Art und Wirkung der Auslösenden Kräfte in der Natur. Eine Physikalisch-biologische Studie. Von Dr. K. Sleeswijk, Nervenarzt, Bloemendaal (Holland). Price M.3.

CHURCHILL, J. AND A., 7, Great Marlborough-street, London, W.

The Use of Shower Baths in Schools in England and on the Continent. By Frederick Rose, Ph.D., Assistant Educational Adviser to the Education Department of the London County Council. A paper read before the Medical Officers of Schools Association, June 14th, 1906. Issued by the Medical Officers of Schools Association. Price 1*s.*

The Schott Methods of the Treatment of Chronic Diseases of the Heart, with an Account of the Nauheim Baths, and of the Therapeutic Exercises. By W. Bezly Thorne, M.D., M.R.C.P. Fifth edition. Price 5*s.* net.

CLINIC PUBLISHING CO., Chicago.

Abbott's Alkaloidal Digest. A Brief Description of the Therapeutics of Some of the Principal Alkaloidal Medicaments and Other Success-makers, with Suggestions for their Clinical Application. By W. C. Abbott, M.D., Editor of the "American Journal of Clinical Medicine." Price not stated.

CONSTABLE, ARCHIBALD, AND CO., LIMITED, 16, James-street, Haymarket, London, S.W.

Atlas of Cutaneous Morbid Histology. By Dr. Max Joseph, Physician for Skin Diseases in Berlin, and J. B. Van Deventer, Oberstabsarzt of the Netherlands East Indian Army in Batavia-Java. Price 18*s.* net.

Diet and Dietetics. By A. Gautier. Edited and translated by A. J. Rice-Oxley, M.A., M.D. Price 18*s.* net.

Mercers' Company Lectures on Recent Advances in the Physiology of Digestion. Delivered in the Michaelmas Term, 1905, in the Physiological Department of University College, London. By Ernest H. Starling, M.D., F.R.S., Jodrell Professor of Physiology. Price 6*s.* net.

COOK, THOMAS, AND SON, Ludgate-circus, London, E.C.

The Swedish Touring Club's Guides. VII. Sweden. Edited by The Swedish Touring Club. With 17 Maps and Seven Plans. Second revised edition. Price 4*s.* net.

DEACON, CHARLES WILLIAM, AND CO., London.

From Her to Him. By George H. R. Dabbs, M.D., Author of "Before Good Night," "From Door to Door," "Ugly: a Hospital Dog," &c. Price 2*s.* 6*d.*

FALCONER, JOHN, 53, Upper Sackville-street, Dublin. (BAILLIÈRE, TINDALL, AND COX, London; JAMES THIN, Edinburgh; JOHN WRIGHT AND CO., Bristol.)

Transactions of the Royal Academy of Medicine in Ireland. Vol. XXIV. Edited by James Craig, M.D., F.R.C.P.I., General Secretary; Physician to the Meath Hospital and County Dublin Infirmary. Price not stated.

FISCHER, GUSTAV, Jena.

Die Neubauten des Allgemeinen Krankenhauses St. Georg, Hamburg. Im Verein mit Dr. Wiesinger, Dr. Simmonds, Dr. Albers-Schönberg, Dr. Adam, und Dr. Schlagintweit. Unter Technischer Mitwirkung von F. Ruppel, Bauinspektor. Herausgegeben von Dr. Deneke, Aerztl. Direktor. Price M.8; geb., M.9.

Über die Untersuchung des gesunden und kranken Gehirnes mittels der Wage. Von Dr. Martin Reichardt. Arbeiten aus der Königlichen psychiatrischen Klinik zu Würzburg. Erstes Heft. Price M.2.50.

Die Nervosität, ihre Ursachen, Erscheinungen und Behandlung. Für Studierende und Aerzte. Von Dr. A. Cramer, a.ö. Professor für Psychiatrie und Nervenheilkunde und Direktor der kgl. Universitäts-Klinik und Poliklinik für psychische und Nervenkrankheiten in Gottingen. Price M.8; geb., M.9.20.

GILL, L. UPCOTT, Bazaar-buildings, Drury-lane, London, W.C. (CHARLES SCRIBNER'S SONS, New York.)

Secrets of Lawn Tennis. By F. W. Payn, Singles ex-Champion of Sweden, Gravesend, Scotland, Nottingham, Russia, Blackheath, Denmark, etc., etc.; Doubles ex-Champion of Holland, Scotland, Russia, Folkestone, Sweden, Vienna, etc. Price 2*s.* 6*d.* net.

GRIFFIN, CHARLES, AND COMPANY, LIMITED, Exeter-street, Strand, London, W.C.

The Treatment of Diseases of the Digestive System. By Robert Saundby, M.D., M.Sc., LL.D., F.R.C.P., Professor of Medicine in the University of Birmingham; Senior Physician to the General Hospital. Price 3*s.* net.

Toxines and Antitoxines. By Carl Oppenheimer, M.D., Ph.D. Translated from the German. By C. Ainsworth Mitchell, B.A. Oxon., F.I.C. Price 7*s.* 6*d.* net.

HARRISON, W. E., The Ancient House Press, Butter Market, Ipswich.

First-Aid Tablets of Fractures. By S. O. Eades, L.R.C.P., L.R.C.S. Edin., Honorary Life Member, Lecturer and Examiner, St. John Ambulance Association; Chief Surgeon, St. John Ambulance Brigade, Ipswich Corps. Price not stated.

HIRSCHWALD, AUGUST, Unter den Linden, 68, Berlin, N.W.

Klinik der Brustkrankheiten. Von Dr. med. Alfred v. Sokolowski, Primararzt im Hospital zum heiligen Geist in Warschau. Erster und Zweiter Bände. Price, two volumes, M.32.

Handbuch der Sauerstofftherapie. Herausgegeben von Dr. med. Max Michaelis, Universitäts-Professor. Price M.12.

J. B. LIPPINCOTT COMPANY, Philadelphia and London.

Lippincott's New Medical Series. Edited by Francis R. Packard, M.D. The Medical Diseases of Infancy and Childhood. With Points on the Anatomy, Physiology, and Hygiene peculiar to the Developing Period. By Alfred Cleveland Cotton, A.M., M.D., Professor of Pediatrics, Rush Medical College, University of Chicago; Attending Physician for Diseases of Children, Presbyterian Hospital; Consultant to the Central Free Dispensary, &c. Price 15s. net.

KIMPTON, HENRY, 13, Furnival-street, Holborn, London, E.C.

A Treatise on Pharmacy for Students and Pharmacists. By Charles Caspari, Jr., Professor of Pharmacy and Director of the Pharmaceutical Laboratory in the Maryland College of Pharmacy, Department of Pharmacy, University of Maryland. Third edition, enlarged and thoroughly revised. Price 21s. net.

The Practice of Gynecology. In Original Contributions by Eminent Authors. Edited by J. Wesley Bovée, M.D., Professor of Gynecology, George Washington University, Washington, D.C. Price 31s. 6d. net.

KING, P. S., AND SON, Orchard House, Westminster, London, S.W.

Glimpses into the Abyss. By Mary Higgs, Author of "The Master," "How to Deal with the Unemployed." Price 3s. 6d. net.

National Conference on Infantile Mortality. Report of the Proceedings of the National Conference on Infantile Mortality, held in the Caxton Hall, Westminster, on the 13th and 14th June, 1906. President: Rt. Hon. John Burns, M.P., President of the Local Government Board. Chairman: Evan Spicer, J.P., Chairman of the London County Council. Price 1s. 6d. net.

LEWIS, H. K., 136, Gower-street, London, W.C.

Studies in Blood Pressure: Physiological and Clinical. By George Oliver, M.D. Lond., F.R.C.P. Price 2s. 6d. net.

The Climate of Lisbon and of the Two Health Resorts in its Immediate Neighbourhood, Mont'Estoril, on the Riviera of Portugal, and Cintra. By Dr. D. G. Dalgado, of the Royal Academy of Sciences of Lisbon. A Paper read before the Section of Hygiene of the Fifteenth International Congress of Medicine, held at Lisbon in April, 1906. Modified and enlarged. Price 2s. 6d.

Hygiene of the Nursery. By Louis Starr, M.D. Seventh edition. Price 3s. 6d.

LONGMANS AND CO., London; B. QUARITCH, London; DULAU AND CO., London; KEGAN PAUL AND CO., London; and BRITISH MUSEUM (NATURAL HISTORY), London.

Illustrations of British Blood-sucking Flies. With Notes by Ernest Edward Austen, Assistant, Department of Zoology, British Museum (N.H.). Price not stated.

MACMILLAN AND CO., LIMITED, London.

Studies in Clinical Psychiatry. By Lewis C. Bruce, M.D., F.R.C.P.E. Price 10s. 6d. net.

MCCLURE, PHILLIPS, AND CO., New York.

Walter Reed and Yellow Fever. By Howard A. Kelly, Professor of Gynecological Surgery, Johns Hopkins University. Price not stated.

NEMNICH, OTTO, Leipzig.

Orthodiagraphische Praxis. Kurzer Leitfaden der Theorie, Technik und Methodik der Orthodiagraphie für Aerzte. Von Dr. Paul C. Franze, prakt. Arzt in Bad Nauheim. Preis, geheftet, M.1.80; gebunden, M.2.50.

NEW SYDENHAM SOCIETY, London.

Selected Essays on Syphilis and Small-pox. Translations and Reprints from Various Sources. Edited by Alfred E. Russell, M.D. Lond., M.R.C.P. Price not stated.

OLIPHANT, ANDERSON, AND FERRIER, Edinburgh and London.

The Origin and Nature of Man. By S. B. G. McKinney, M.A., L.R.C.P. Edin. Part VI. The Formal Cause. Price 6d. net.

ORANGE JUDD COMPANY, New York. (KEGAN PAUL, TRENCH, TRÜBNER, AND CO., LIMITED, London.)

Modern Methods of Testing Milk and Milk Products. By Lucius L. Van Slyke, Chemist of the New York Agricultural Experimental Station. Price 4s. net.

PATON, J. AND J., 143, Cannon-street, London, E.C.

Paton's List of Schools and Tutors. (An Aid to Parents in the Selection of Schools.) Ninth annual edition, 1906–1907. Price 1s. 6d.

REBMAN, LIMITED, 129, Shaftesbury-avenue, London, W.C.

Handbook of Electricity in Medicine. By Dr. W. H. Guilleminot (Paris). Translated by W. Deane Butcher, M.R.C.S., Surgeon to the London Skin Hospital. Price 17s. net.

Elementary Manual of Regional Topographical Dermatology. By R. Sabouraud, Director of the City of Paris Dermatological Laboratory, St. Louis Hospital. English translation by C. F. Marshall, late Assistant Surgeon to the Hospital for Diseases of the Skin, Blackfriars, London. Price 21s. net.

The Treatment of Syphilis. By Alfred Fournier, Professor at the Faculty of Medicine, Member of the Academy of Medicine, Physician to the St. Louis Hospital, Paris. English translation of the second edition (revised and enlarged). By C. F. Marshall, M.D., F.R.C.S., late Assistant Surgeon to the Hospital for Diseases of the Skin, Blackfriars, London; formerly Resident Medical Officer to the London Lock Hospital. Price 21s. net.

Portfolio of Dermochromes. By Professor Jacobi, of Freiburg im Breisgau. English adaptation of text by J. J. Pringle, M.B., F.R.C.P., Physician to the Department for Diseases of the Skin at the Middlesex Hospital, London. Supplement. Price, loose plates, £1 5s. net; half-roan binding, £1 8s. 6d. net; full roan binding, £1 11s. 6d. net

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Un Médecin Grec du IIe Siècle Ap. J.-C. Précurseur de la Méthode Expérimentale Moderne. Ménodote de Nicomédie. Par le Docteur Albert Favier, de l'Université de Paris, Professeur de Philosophie au Lycée du Puy, Officier d'Académie. Price Fr.10.

Les Auto-Mutilateurs. Etude Psycho-Pathologique et Médico-Légale. Par le Dr. Charles Blondel, Ancien Élève de l'Ecole Normale Supérieure, Ancien Pensionnaire de la Fondation Thiers, Agrégé de Philosophie. Price Fr.3.

SCIENTIFIC PRESS, LIMITED, 28 and 29, Southampton-street, Strand, London, W.C.

Muscles and Nerves. An Atlas of the Superficial Muscles and the Principal Motor Nerves of the Human Body for the Use of Students of Anatomy and Nurses. By Louis B. Rawling, F.R.C.S., Assistant Surgeon and Senior Demonstrator of Anatomy at St. Bartholomew's Hospital. Price 3s. 6d. net.

SIMPKIN, MARSHALL, HAMILTON, KENT, AND CO., LIMITED, London.

The Rise and Progress of Hydropathy in England and Scotland. By Ritchard Metcalfe, author of "Sanitas Sanitatum et Omnia Sanitas," "Life of Vincent Priessnitz," "Essays and Notes on Hydrotherapeutics," &c. Price 3s. 6d. net.

SURGERY PUBLISHING COMPANY, 92, William-street, New York.

Surgical Suggestions. Practical Brevities in Diagnosis and Treatment. By Walter M. Brickner, M.D., Chief of Surgical Department, Mount Sinai Hospital Dispensary; Editor-in-chief, "American Journal of Surgery," New York; and Eli Moschcowitz, M.D., Assistant Physician, Mount Sinai Hospital Dispensary; Editorial Associate, "American Journal of Surgery," New York. Price 50 cents.

THIEME, GEORG, Leipzig.

Vorlesungen für Schiffsärzte der Handelsmarine über Schiffshygiene, Schiffs- und Tropenkrankheiten. Von Medizinalrat Dr. B. Nocht, Leiter des Hamburgischen Medizinalamtes, Chefarzt des Seemannskrankenhauses und des Institutes für Schiffs- und Tropenkrankheiten in Hamburg. Price not stated.

UNIVERSITY PRESS, Manchester. (SHERRATT AND HUGHES, 60, Chandos-street, London, W.C., and Manchester.)

A Handbook of Legal Medicine. Intended for the Use of the Legal Profession. By William Sellers, M.D. Lond., of the Middle Temple and the Northern Circuit, Barrister-at-Law. Price 7s. 6d. net.

VIGOT FRÈRES, 23, Place de l'Ecole-de-Médecine, Paris.

Traité des Variations des Os de la Face de l'Homme et de Leur Signification au Point de Vue de l'Anthropologie Zoologique. Par M. le Dr. A.-F. Le Double, Professeur d'Anatomie à l'Ecole de Médecine de Tours, Membre Correspondant de l'Académie de Médecine. Price Fr.25.

VOGEL, F. C. W., Leipzig.

Handbuch der Kinderheilkunde. Herausgegeben von Prof. Dr. M. Pfaundler in München, und Prof. Dr. A. Schlossmann in Düsseldorf. 2 Bände. 1 und 2 Hälfte. Price M.30.

W. B. SAUNDERS COMPANY, Philadelphia and London.

A Text-book of Pharmacology and Some Allied Sciences (Therapeutics, Materia Medica, Pharmacy, Prescription-Writing, Toxicology, &c.), together with Outlines for Laboratory Work, Solubility and Dose Tables, &c. By Torald Sollmann, M.D., Professor of Pharmacology and Materia Medica in the Medical Department of Western Reserve University, Cleveland, Ohio. Second edition, thoroughly revised and greatly enlarged. Price 18s. net.

Diet in Health and Disease. By Julius Friedenwald, M.D., Clinical Professor of Diseases of the Stomach in the College of Physicians and Surgeons, Baltimore; and John Ruhräh, M.D., Clinical Professor of Diseases of Children in the College of Physicians and Surgeons, Baltimore. Second edition, thoroughly revised and enlarged. Price 18s. net.

WATTS AND CO., 17, Johnson's-court, Fleet-street, London, E.C.

Sunday Observance: Its Origin and Meaning. By W. W. Hardwicke, M.D., Author of "The Evolution of Man and His Religious Systems," etc. Price 6d.

WRIGHT, JOHN, AND CO., Stone Bridge, Bristol. (SIMPKIN, MARSHALL, HAMILTON, KENT, AND CO., LIMITED, London.)

The Medical Annual Synoptical Index to Remedies and Diseases. For the Six Years, 1899 to 1904. Price 7s. 6d. net.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

ALLKIN, F. W., L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been re-appointed Medical Officer of Health to the Denton District Council.

BECKETT, F. H., M.B. B.C. Cantab., has been appointed Certifying Surgeon under the Factory and Workshop Act for the Ely District of the county of Cambridge.

EVANS, JOHN, M.B. B.S. Lond., M.R.C.S., L.R.C.P. Lond., has been appointed Clinical Assistant to the Hospital for Consumption and Diseases of the Chest, Brompton.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BATH, ROYAL UNITED HOSPITAL.—House Surgeon. Salary £80 per annum, with board, lodging, and washing.

BIRMINGHAM ASYLUM, Rubery-hill.—Assistant Medical Officer. Salary £150 per annum, with apartments, board, &c.

BRIGHTON, SUSSEX COUNTY HOSPITAL.—Second House Surgeon, unmarried. Salary £60 per annum, with board, residence, and washing.

BUXTON, DEVONSHIRE HOSPITAL.—Assistant House Surgeon. Salary £70 per annum, with apartments, board, and laundry.

CAPE OF GOOD HOPE, GREY HOSPITAL, King William's Town.—Resident House Surgeon, unmarried. Salary at rate of £300 per annum, with quarters and one ration.

CARLISLE, CUMBERLAND INFIRMARY.—Resident Medical Officer. Salary at rate of £80 and £100 per annum, with board, lodging, and washing.

CHESTER GENERAL INFIRMARY.—House Physician. Salary £90 per annum, with residence and maintenance.

CHESTERFIELD AND NORTH DERBYSHIRE HOSPITAL AND DISPENSARY.—Senior House Surgeon. Salary £120 per year, with board, apartments, and laundress.

DORCHESTER, COUNTY ASYLUM.—Junior Assistant Medical Officer, unmarried. Salary £140, rising to £180, with board, lodging, &c.

EDINBURGH, SCHOOL OF MEDICINE OF THE ROYAL COLLEGES.—Lecturership in Physiology.

EGYPTIAN GOVERNMENT, MINISTRY OF EDUCATION.—Professor of Midwifery and Gynæcology. Salary £400 a year. Also Medical Tutor and Registrar to Kasr-el-Ainy Hospital. Salary £400 a year.

LIVERPOOL, ROYAL SOUTHERN HOSPITAL.—Three House Physicians and One House Surgeon. Salaries at rate of £60 per annum, with board and residence. Also Resident Pathologist and Registrar. Salary £100, with board and residence.

LIVERPOOL STANLEY HOSPITAL.—Second and Third House Surgeons. Salary £70 and £60 per annum respectively, with board, residence, and washing.

LIVERPOOL, WORKHOUSE AND HOSPITAL, Rice-lane, Walton.—Assistant Resident Medical Officer, unmarried. Salary £125 per annum, with board.

LONDONDERRY AND NORTH-WEST OF IRELAND EYE, EAR, AND THROAT HOSPITAL.—Honorary Surgeon.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury.—Junior Resident Medical Officer, unmarried. Salary at rate of £60 a year, with board and lodging.

MANCHESTER HOSPITAL FOR CONSUMPTION.—Assistant Medical Officer for Crossley Sanatorium, Delamere Forest. Also Resident Medical Officer for Hospital at Bowdon. Salary in each case £100 per annum, with board, &c.

MOUNT VERNON HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Hampstead and Northwood.—Resident Medical Officer. Honorarium £50 per annum, including board, lodging, &c.

NEWPORT AND MONMOUTHSHIRE HOSPITAL.—Junior Resident Medical Officer. Salary £70 per annum, with board, residence, and washing.

PETERBOROUGH INFIRMARY AND DISPENSARY.—Physician and Assistant Physician.

SOUTHWARK UNION INFIRMARY, East Dulwich-grove, S.E.—Third Assistant Medical Officer. Salary £100 per annum, with board, lodging, and washing.

WARRINGTON UNION WORKHOUSE.—Resident Medical Officer, unmarried. Salary £130 per annum, with apartments, rations, and allowances.

WEST BROMWICH DISTRICT HOSPITAL.—Resident Assistant House Surgeon, unmarried. Salary £50 per annum, with board, residence, and washing.

WEST LONDON HOSPITAL, Hammersmith-road, W.—Two House Physicians and Three House Surgeons for six months. Board, lodging, and laundry provided.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—Assistant House Physician for six months. Salary at rate of £75 per annum, with board, lodging, and washing.

YORK COUNTY HOSPITAL.—House Physician. Salary £100 per annum, with board, residence, and washing.

YORK DISPENSARY.—Resident Medical Officer, unmarried. Salary £120 a year, with board, lodging, and attendance.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies as Certifying Surgeons under the Factory and Workshop Act at Stepney, in the county of London; at Corris, in the county of Merioneth; and at Dawlish, in the county of Devon.

Births, Marriages, and Deaths.

BIRTHS.

JACOB.—On August 14th, at Hindes-road, Harrow, the wife of Archibald H. Jacob, L.R.C.P. & C.S. Irel., of a daughter.

SELIGMANN.—On August 14th, at York-terrace, Regent's Park, the wife of Charles G. Seligmann, M.B., of a daughter.

MARRIAGES.

MCALLUM—COOKE.—On August 18th, at St. Jude's Church, Southsea, Donald C. A. McAllum, M.B. Edin., to Louisa, only daughter of the late Colonel A. H. Cooke, Indian Staff Corps, and of Mrs. Cooke of Queen's-terrace, Sussex-road, Southsea.

TATE—BEETON.—On August 14th, at Streatley Church, Captain Godfrey Tate, I.M.S., to Dorothy, younger daughter of the late Edmund M. Beeton and Mrs. Beeton of Tweenways, Streatley, Berks.

Notes, Short Comments, and Answers to Correspondents.

THE QUESTION OF IMMEDIATE ATTENDANCE.

ON August 15th, Mr. C. C. Becke, the coroner for Northampton, held an inquest into the causes attending the death of a man named Isaacs, aged 34 years. The widow in her evidence stated that on Sunday afternoon her husband had complained of feeling ill. On the Monday he did not go to work. On Tuesday morning at 9 o'clock she communicated with the Medical Institute. The medical man came a few minutes before 6 P.M. He prescribed some medicine which witness went up to the Institute to fetch but her husband died just as she was about to give it to him. Dr. William George Sutherland, the medical man, stated that he had been called to see the deceased on the Tuesday morning. It appears that he was acting as locum-tenent for the regular medical man attached to the Institute. As he was a stranger to Northampton he inadvertently did not get to the deceased's house till between 5 and 6. He considered the deceased to be suffering from catarrh of the stomach and he was collapsed. Dr. Sutherland went on to say that he had made a post-mortem examination and found all the abdominal organs healthy except the stomach. The heart was very much enlarged and covered with a layer of fat. The condition could not be diagnosed during life for a certainty. In answer to a juror Dr. Sutherland said he was not told in the morning that the case was urgent. The jury found that death was due to natural causes, but the foreman added "but at the same time the jury express regret at the neglect apparently of the doctor in not going earlier. There might have been a little possibility of doing something for the man." It was stated that Dr. Sutherland had only been in the town for three days and that it was naturally difficult for him to pick up every case. The coroner is reported as saying "He had him on his list and he ought to tick the cases off as he attends them." We cannot quite see what the coroner meant by this remark, for whether the name was ticked off or not it would have made no difference to the time at which Dr. Sutherland arrived. The coroner further remarked that if the relatives had any complaint to make they might make it to the committee of the Institute. We have no knowledge whether they did or did not make such complaint, but in the *Northampton Independent* of August 18th appears the following advertisement on p. 19:—

FRIENDLY SOCIETIES' MEDICAL INSTITUTE.

50, Broad-street, Northampton,
Thursday, August 15th (*sic*), 1906.

We beg to state in connection with the inquest held yesterday on the body of W. E. Isaacs that the *locum tenens* engaged in Dr. Bensley's absence on his annual holiday has been dismissed from his practice at the above Institute.

On behalf of the Committee,
J. J. W. PAGE, President,
J. B. PALMER, Secretary.

This friendly society does not seem to be a very just employer. When Dr. Sutherland was summoned in the morning he was not told that there was any urgency in the case. It was no doubt regrettable that this particular case was left until the last, but presumably, seeing the patient's condition, it would have made no difference whether Dr. Sutherland had arrived early or late, and the error by which he arrived late was fully explained. It would be interesting to know what the Friendly Societies' Medical Institute pays its medical men, but we at any rate congratulate Dr. Sutherland upon no longer being its employé.

QUACK ADVERTISING.

LAST week we commented upon the circular of a touting agency which professed to have been given the name of a medical man to whom it wrote. Another correspondent, who is a physician to a well-known hospital in the West of London, has sent us several circulars which he has received from the M. A. Winter Co. of Washington, D.C., North America. The circular quoted is, as will be seen, in the same style as that which we mentioned last week. Our correspondent, who has never acted as agent to any company, was naturally surprised by receiving a long circular letter of which we reproduce the commencement and a few subsequent paragraphs.

DEAR FRIEND,—Your name has been handed to us by a business concern with whom you have been corresponding as a good party to take up our work in your section. The company speaks in the highest terms of your ability as an agent; therefore we are very anxious that you should work for us. ..... In fact, we believe you are just the right person to push such a good and profitable business as we offer you for all it is worth. ..... By selling this remedy you are building up a trade which will not stop but will go on increasing from year to year, because it becomes a staple article just like sugar or flour.

The remedy in question, which is guaranteed by the vendors to mitigate or remove a great variety of ailments, is "composed of the choicest barks, roots, and herbs." It is put up in boxes, 12 of which

can be bought by the agent for £1 7s. 1d. for resale to the public at 4s. 2d. each. The absurdity of asking a medical man to sell a quack remedy of unknown composition, guaranteed to give relief in a multitude of diseases, might serve a purpose in a jest-book but not elsewhere. The truth is that both the M. A. Winter Co. and its wonderful medicines are unworthy of serious consideration.

APPLIANCES FOR RESCUE WORK IN MINE ACCIDENTS.

RESCUE parties in mine accidents are very often exposed to the dangers incidental to an irrespirable atmosphere, and firemen are similarly liable to be overcome by smoke and acrid or poisonous fumes. In THE LANCET of August 13th, 1904, p. 477, we described an apparatus devised by Dr. Guglielminetti of Paris for the purpose of reducing these risks. It consisted principally of a helmet something like that of a diving dress but made of aluminium instead of copper; a cylinder of compressed oxygen carried on the back; a vessel containing trays of caustic potash to absorb the respiratory carbon dioxide; and a flexible breathing bag filled with ordinary atmospheric air, the nitrogen of which remained unchanged, while the oxygen was renewed from the cylinder and the carbon dioxide removed by the caustic potash. A man can easily carry enough oxygen to last for 30 minutes. Various contrivances for the same purpose have been introduced by inventors such as Fleuss and more recently by Herr Meyer of a Westphalian colliery, but they are all on very much the same lines. A few of them are enumerated in THE LANCET of Feb. 17th, 1906, p. 488. Several years ago, however, an inventor residing in the north of England brought to the office of THE LANCET a loose overcoat of air-proof material with a lining of the same; this when inflated with ordinary air by a bellows held a supply which could be inhaled with a face-piece and was sufficient to last for a good while. In the terrible disaster which occurred at the Courrières collieries in the north-east of France early in the present year Herr Meyer having brought men and appliances from Westphalia was able to do important rescue work. The Westphalian exploring party carries a telephone by means of which communication is maintained with those who are in places of safety. Mr. Sydney F. Walker, writing in the New York *Electrical Review* of August 4th, on the general subject of rescue after mine accidents, says that there is an ever present danger of the collapse of the explorer partly from fatigue due to the weight of the apparatus carried and the bad state of the roadways after an explosion, and partly from the gradual vitiation of the air which he breathes owing to the slow removal of the carbon dioxide by the caustic potash. Mr. Walker therefore suggests that the bodily condition of the explorer who carries a telephone might always be known at the safety station in his rear if a microphone were placed on some convenient artery and connected with a telephone at the safety station, where a surgeon might infer the condition of the distant explorer from the sounds heard in the telephone. A somewhat similar arrangement might also be connected to some part of the explorer's chest, so that the laboured breathing which accompanies exhaustion, whether from exertion or from the presence of much carbon dioxide in the inhaled air, might also be read at the pit bottom.

HARVEST BUGS.

To the Editors of THE LANCET.

SIRS,—"L.R.C.P." should try commercial carbolic acid as a general disinfectant. Powdered borax may also be dusted here and there on the surface of the body. Menthol dissolved in petrosol, spirit, or oil, applied by spray or on cotton-wool, will give instant relief to irritation.

I am, Sirs, yours faithfully,

Annfield Plain, August 18th, 1906. W. G. PRETSELL.

MARGARINE AND PREJUDICE.

THERE is after all a good deal in a name or the lay mind would not regard with so much apparent prejudice that excellent and wholesome substitute for butter—margarine. One worthy London alderman seems to think that it is no better than, say, train oil, for on imposing very properly a fine on a certain catering company last week for selling butter which was not in fact butter but margarine, he was induced to reduce the maximum penalty because the defendant's solicitor had given an assurance that margarine would not be used again *even for cooking purposes*. Now, the Sale of Food and Drugs Act does not require that butter and nothing but butter should be used for cooking purposes, and there is no reason why it should do so. It is, in fact, possible that margarine is better for some cooking purposes than butter. Margarine is an excellent and palatable fat food and its process of manufacture is calculated to render it less open to bacteriological suspicions than butter. Margarine is not, and never can be, butter, any more than apples can be peaches, but that is no reason why apples should not be perfectly good food material.

A LIST OF OFFICIAL CHEMICAL APPOINTMENTS.

UNDER the direction of the Council of the Institute of Chemistry Mr. Richard B. Pilcher, the secretary of the institute, has compiled a list of the official chemical appointments held in Great Britain and Ireland, in India, and the colonies. In some ways the book has its prototype in the Medical Directory, while it serves to indicate the increasing appreciation of chemical investigation by departments of State, Colonial governments, local authorities, and public institutions throughout the British empire. It includes a very complete list of the names of the professors and teachers of chemistry in universities, colleges, and technical schools, and also the names of the analysts appointed under the provisions of the Sale of Food and Drugs Act. We believe that the publication is the first of its kind connected with the practice of professional chemistry, and though intended primarily for the use of consulting and analytical chemists it will obviously be useful for reference to public authorities, and indeed to all interested in the applications of chemistry to State matters and in the promotion of higher education in chemical science.

THE GERMAN LANGUAGE AND MEDICAL MEN.

To the Editors of THE LANCET.

SIRS,—In the Annotations column of THE LANCET of August 18th you refer to the small number of medical men who are able to read German medical books. Dr. Fiedler, professor of German in the University of Birmingham, with the assistance of his colleague, Mr. Sanbuch, has recently brought out an excellent little book designed to teach busy men enough German to enable them to keep abreast of German scientific literature. The plan of the work is simple and practical and the price is small—2s. 6d.

I am, Sirs, yours faithfully,

Birmingham, August 20th, 1906. ARTHUR LOXTON.

THE TREATMENT OF FŒTID FEET WITH CHROMIC ACID.

Dr. Sabouraud, in the *Journal de Pharmacie et de Chimie* of July 16th, recommends the use of a 4 per cent. solution of crystals of chromic acid in distilled water in cases of fœtid perspiration of the feet. The lotion is applied briskly by means of a plug of cotton-wool, care being taken that the liquid thoroughly penetrates between and under the toes. The treatment should be repeated daily for a few days, then every second day, every third day, until finally one application a week is usually sufficient to complete the cure. Dr. Sabouraud states that unpleasant odours of the feet rapidly disappear under this treatment and that the effect remains for a considerable time. The lotion should never be applied twice on the same day owing to the risk of producing an erythematous eruption lasting several days.

THE LAW, THE MEDICAL MAN, AND THE MOTHER.

To the Editors of THE LANCET.

SIRS,—I was called upon one night recently by the usual constable with the usual slip of paper stating that a male child had been found deserted, &c., and asking if I could throw any light on the subject from any confinements I had attended lately. He could not say whether the child was found living or dead.

As a fact I had attended no labours for months, and said so; but not being busy at the time, and the man being of intelligence, I discussed with him the ethical question of giving or withholding such information. Inviolable confidence between practitioner and patient was the line I took, and take; whilst one's duty as a citizen was his standpoint, a duty, he contended, that is paramount to all other considerations.

The point is interesting, and not infrequently arises in general practice.

I am, Sirs, yours faithfully,

August 14th, 1906. M.B. LOND.

Lex.—Our correspondent is entitled to deduct the cost of feeding the patients, whether the diet is special or otherwise; but he is not entitled to deduct anything for medical attendance.

Chantry-road.—Our correspondent who wrote from this address but who omitted to sign his name is advised to consult the public analyst for his district.

ERRATUM.—Mr. J. Lionel Stretton writes:—In my description of Two Unique Congenital Deformities in the Abdomen of the Same Patient reported in your issue of August 18th, p. 440, there is an obvious error. "Cardiac end of the stomach" should read "*pyloric end.*"

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, August 23rd, 1906.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Aug 17	29·82	W.	0·19	114	68	56	57	60	Cloudy
" 18	29·93	W.	...	101	65	53	55	58	Cloudy
" 19	30·18	W.	...	112	67	54	56	59	Cloudy
" 20	30·14	W.	...	94	72	53	57	61	Cloudy
" 21	30·16	W.	...	125	81	61	65	68	Fine
" 22	30·00	S.W.	...	126	85	63	66	70	Fine
" 23	29·90	S.W.	...	117	75	63	64	67	Fine

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (27th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (3 P.M.).

TUESDAY (28th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.), Chelsea (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (2 P.M., Ophthalmic, 2.15 P.M.).

WEDNESDAY (29th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Ear (2 P.M.), Royal Orthopædic (3 P.M.), Children, Gt. Ormond-street (9.30 A.M., Dental, 2 P.M.).

THURSDAY (30th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Royal Orthopædic (9 A.M.), Royal Ear (2 P.M.), Children, Gt. Ormond-street (2.30 P.M.).

FRIDAY (31st).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.), Central London Throat and Ear (2 P.M.), Children, Gt. Ormond-street (9 A.M., Aural, 2 P.M.), St. Mark's (2.30 P.M.).

SATURDAY (1st).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.), Children, Gt. Ormond-street (9.30 A.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (27th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith road, W.).—2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations. Diseases of the Eye.

TUESDAY (28th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—2 P.M.: Medical and Surgical Clinics. Diseases of the Throat, Nose, and Ear. 2.30 P.M.: X Rays. Operations. Diseases of the Skin.

WEDNESDAY (29th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Diseases of the Throat, Nose, and Ear. Diseases of Children. 2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations.

THURSDAY (30th).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations. Diseases of the Eye.

FRIDAY (31st).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—2 P.M.: Diseases of the Throat, Nose, and Ear. Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations. Diseases of the Skin.

SATURDAY (1st).—POST-GRADUATE COLLEGE (West London Hospital, Hammersmith-road, W.).—10 A.M.: Diseases of the Throat, Nose, and Ear. 2 P.M.: Medical and Surgical Clinics. 2.30 P.M.: X Rays. Operations.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1906, which was completed with the issue of June 30th, and the Title-page to the Volume, were given in THE LANCET of July 7th.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1906 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

Cases for binding the half-year's numbers are also ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will insure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

The rates of subscriptions, post free, either from THE LANCET Offices or from Agents, are:—

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Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London and Westminster Bank, Westminster Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE. It has come to the knowledge of the Manager that in some cases higher rates are being charged, on the plea that the heavy weight of THE LANCET necessitates additional postage above the ordinary rate allowed for in the terms of subscriptions. Any demand for increased rates, on this or on any other ground, should be resisted. The Proprietors of THE LANCET have for many years paid, and continue to pay, the whole of the heavy cost of postage on overweight foreign issues; and Agents are authorised to collect, and generally do so collect, from the Proprietors the cost of such extra postage.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied. Address—THE MANAGER, THE LANCET OFFICES, 423, STRAND, LONDON, ENGLAND.

During the week marked copies of the following newspapers have been received: *Leeds and Yorkshire Mercury, Liverpool Courier, Northern Whig, Telegraph, Daily News, Morning Post, Daily Mail, Evening Express (Liverpool), Morning Leader, Globe, Bristol Times, Bolton Chronicle, Bristol Mercury, Westminster Gazette, Birmingham Post, Hampshire Advertiser, Southampton Echo, Wolverhampton Midland Express, Newcastle Chronicle, Herts Mercury, Scientific American, Literary Digest, &c.*

Communications, Letters, &c., have been received from—

A.—Dr. F. W. Alexander, Eastbourne; Mr. S. Appleton, Lond.; Messrs. Allen and Hanburys, Lond.; Mr. E. Arnold, Lond.

B.—Messrs. Burroughs Wellcome, and Co., Lond.; Messrs. J. Beal and Son, Brighton; Captain R. J. Blackham, R.A.M.C., Devonport; Messrs. T. B. Browne, Ltd., Lond.; Mr. W. Naylor Barlow, Bootle.

C.—Dr. William Collingridge, Lond.; Cumberland Infirmary, Carlisle, Secretary of; Cheltine Foods and Chocolate, Ltd., Cheltenham, Manager of; C. W.; Children's Country Holidays Fund, Lond., Chairman of; Mr. F. W. Clarke, Chorlton-cum-Hardy; Messrs. Cornish Bros., Birmingham; Messrs. J. and A. Churchill, Lond.; Dr. G. H. Colt, Lond.

D.—Messrs. Down Brothers, Lond.

E.—Electrical Standardising, &c., Institution, Lond., Secretary of.

F.—Messrs. Feuerheerd Bros. and Co., Lond.; Dr. J. L. Falconer, Pendlebury.

G.—Dr. Reginald Green, King's Norton; Messrs. W. Green and Sons, Edinburgh; Mr. H. R. Gawen Gogay, Southchurch Beach.

H.—Dr. P. W. Hampton, Wigan; Dr. Francis Hawkins, Reading; Mr. W. S. Handley, Lond.; Mr. J. M. Hobson, Croydon; Messrs. Hastings Bros., Lond.; H. C. M. D.; Mr. Thomas Heard, Cheltenham; Messrs. Harvey Brothers, Lond.; Mr. W. L. Harnett, Lond.; Messrs. Haasenstein and Vogler, Cologne.

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K.—Dr. J. Kerr, Perth; Dr. C. F. Knight, Portobello; Messrs. R. A. Knight and Co., Lond.

L.—Locum, Newport.

M.—Dr. P. W. MacDonald, Dorchester; Manchester Children's Hospital, Secretary of; Medical Supply Agency, Delhi; M.D.; Mr. Pelham C. Maitland, Lond.; Mr. R. Goodwin Mumbray, Deal; Maltine Manufacturing Co., Lond.; Mr. W. Maher, Cork; Messrs. May, Roberts, and Co., Lond.; Messrs. Manlove, Alliott, and Co., Nottingham; Medical Graduates' College and Polyclinic, Lond., Secretary of; Dr. Charles Mackey, Lancaster; Mr. H. M. Masina, Bombay; Manchester Hospital for Consumption, Secretary of.

N.—Mr. P. C. Nandi, Calcutta; Nightingale Fund, Secretary of; Newport and Monmouthshire Hospital, Secretary of; Mr. H. Needes, Lond.; Mr. J. C. Needes, Lond.

O.—Mr. A. W. Ormond, Lond.; *The Onlooker*, Lond., Editor of.

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